Railway Age Gazette

Including the Railroad Gazette and The Railway Age

PUBLISHED EVERY FRIDAY, AND DAILY EIGHT TIMES IN JUNE, BY THE RAILROAD GAZETTE (INC.), 83 FULTON ST., NEW YORK.

CHICAGO: Plymouth Bldg. CLEVELAND: Williamson Bldg.
LONDON: Queen Anne's Chambers, Westminster.

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Subscriptions, including regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico	$5.00 a year.
Canada	6.00 a year.
Foreign Edition (London)	£1 12s. ($8.00) a year.
Single Copies	15 cents each.

Shop Edition and the eight M. M. and M. C. B. Convention Daily issues, United States and Mexico, $1.50; Canada, $2.00; Foreign, $3.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

VOL. 49. DECEMBER 23, 1910. NUMBER 26.

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THE vice-president and general manager of the Interborough Rapid Transit in New York city has made a polite as well as frank statement to the public, detailing his undertakings to supply and use more cars, and to equip all express trains with center and side-door cars, which have been shown to facilitate passenger movement at the platforms, shorten the station stops, quicken the schedule and increase the capacity of the subway. It is a pity that this performance of public duty did not come voluntarily, but waited on years of public agitation, orders from the Public Service Commission, and finally the certainty of a suit for penalties instituted by the commission. It is a pity, too, that the lesson to the ordinary citizen is that decent treatment from a corporation needs to be fought for. Harm has been done to every other railway office and company by these acts More corporate hostility can be so created by one reactionary railway officer than can be reduced or cancelled by frankness, courtesy and initiative in improvement of the service by many broader minded officers. In this case the officer took little action as the overcrowding grew to indecency and assumed a hostile attitude at the commission inquiries. The commission employed Bion J. Arnold, who recommended the improvements now being tardily made. His experiments with side doors met with no cordial or information-seeking reception from the officer in charge; on the contrary, he publicly jeered at slight detentions and failures in those successful experiments. Now, all seems to be changed. The transportation facilities are to be increased by 325 new cars, 469 reconstructed cars, longer platforms and improved signals and brakes, which will largely relieve the congestion—and increase the earnings. The grace of the act is lost in that it is compulsory, nevertheless it is now politely announced, for the general manager "respectfully invites the aid of the Public Service Commission." In re-establishing reasonable, businesslike relations between railways and their customers, politeness is a factor, and this because it is in form the logical and necessary result of a proper regard for the opinions and the feelings of others.

THE Canadian Northern Ontario Railway Company.

CIRCULAR NO. 217. To Trainmen and Station Agents:

The Editor of the *Railway Age Gazette*, in commenting on an article entitled Good Passenger Service, says: "Trainmen and station men who use the term lady, in the place of madam, ought to be fined a day's wages." This is quoted to show how strongly some people feel about this matter. However, I desire to put it on record that the use of lady in addressing our patrons of the gentler sex is incorrect, and hereafter all employees are requested to use the term madam.—A. J. HILLS, Superintendent.

In this way and in many others dignity and good manners are being taught on American railways, and it will have a part, an essential part, in establishing a right relation between the carriers and the carried. In Italy there is a league known as "Pro Gentillezza," and its counterpart has been organized in Berlin with a title which may be translated, "League of Politeness." It begins with a charter membership of 2,500, and its founder, Fraulein Meyer, proposes like organizations for America, England and France. The members are pledged to wear a badge which is a reminder to the wearer always to be polite, and to indicate to persons who see it that they are dealing with a courteous individual. It is hoped that trainmen will recognize these badges and, in turn, cause their own uniforms to convey a like intimation. The position of General Manager can, of itself, be made to bear a similar message to the public.

IF the figures of the new Yale catalogue of living graduates of the university are a broad test, the alumni of our universities and colleges are not going into transportation as a life work. The whole number of Yale graduates alive is 15,958 and the increase during the last six years is 26 per cent., while the number of living Yale men in transportation is but 198 and the increase during six years considerably less than 4 per cent. A closer test may be applied to the Sheffield Scientific School, the technical department of the university, with its present roll of 1,322 students under instruction and 1,004 regular undergraduate students. Its living graduates, numbering 4,019, show an increase of 40 per cent. during the last six years; yet it has but 76 graduates in transportation, an increase during the six years of 17 per cent., while the academic department (the college) with 8,266 living graduates, and an increase of nearly 18 per cent., shows a decrease of 121 to 109 of its graduates in transportation during six years and a loss of 10 during the last two years. There are, obviously, some modifying facts. Probably a certain probation of the civil, mechanical and electrical engineers employed by the railway and other transportation companies between themselves as in "Engineering" rather than in "Transportation," and there are industries allied to transportation that do not carry that name in the Yale vocation returns. But on the

other hand, one would think, with the strong drift in these days of the college man into business, that a vocation so nearly connected with business as transportation is, in many of its branches, would draw a large ratio of the graduates of the big universities.

As being typical, probably, of situations at other ports with railway terminals, we give place, in another column, to President Dowe's final word on the situation at New Haven, Bridgeport and New London. A fresh examination of the federal engineers' chart shows at East Bridgeport 2,200 ft. of water frontage, almost immediately below the drawbridge, very little improved besides the dredged Johnson's Creek channel of 1,300 ft.; and it is further disclosed by engineering testimony that a large part of the federal grants were made on the theory of construction on the harbor's west side by the railway company of the local landings to cost $400,000, which the controversy with the city later drove away. The railway company says that its coal business by water is larger than its all-rail coal business, notwithstanding that the latter is increased by the demands of the inland consignees who prefer all-rail coal—there being less breakage and also less delay, as well as avoidance of the difficulty of receiving whole cargoes owing to lack of storage room. The railway company declares itself hospitable to spur tracks to private piers—though, doubtless, not so hospitable to competitors any more than a merchant would welcome to a corner of his store a rival in his own line of trade. We confess surprise at Mr. Dowe's statement that "New London has no dock connection with the New Haven road" when the local map shows the road's direct connection with its boat line wharf and other connection with wharf properties not quite so direct. The company says that the Eastern Shipbuilding Company probably was sold because the corporation had no use for it—that fact surely militating seriously against Mr. Dowe's theories of the road's holding fast its water fronts from the monopolistic motive. Finally, attention may be called again to the federal harbor expenditure of $3,776,000 at the three ports and on the river Thames; to the great private water frontage at the three ports corresponding to that big federal outlay; and to the more comprehensive fact, not limited to the three ports, of railway energy at water terminals as contrasted with private inertia, though it may be that the inertia is often due less to the individual than to basic conditions of an economic nature.

MORE MISREPRESENTATIONS FROM THE ILLINOIS MANUFACTURERS' ASSOCIATION

In its annual report the Illinois Manufacturers' Association resumes its campaign of misrepresentation of railways. One of its assertions is that the advances in freight rates proposed by the Burlington alone would amount to $1 per year apiece for every one of the 7,300,000 men, women and children located in the counties that it traverses. President Miller of the Burlington has issued a reply showing that according to the sworn testimony of the witnesses of this road the advances proposed by it, and which are now under invetsigation by the Interstate Commerce Commission, would amount to only $237,200 per year, or but 3¼ cents for each person in the counties through which the Burlington runs. To those who have not followed the past career of the Illinois Manufacturers' Association, a statement which contains 96¾ per cent. falsehood, and 3¼ per cent. truth, may seem rather bad. But, for it, this is pretty good. Ordinarily its statements do not contain so much truth.

In other parts of its statement the association strikes its normal gait. For example, it says: "We think it is little short of criminal for the consumers of railway supplies (that is, the railways) to whip the producers (that is, the supply men) into leading a campaign that has in view the swelling of their (the railways') already swollen coffers." The implication that the railways have "whipped" the producers of railway supplies into "leading a campaign" for the retsoration of railway prosperity is 100 per cent. false. The movement which resulted in the organization of the Railway Business Association, and the campaign for fair regulation of railways, which since has been carried on by it, originated entirely with the railway supply concerns, and the railways have never had anything to do with it. Once in a while, it is true, some tactless railway purchasing agent has tried to tell the supply men how they ought to go about their work, but he has always been informed politely but firmly that the supply men are paddling their own canoe, that they are paddling it for their own benefit, and that when they want advice from railway men they will ask for it. The reason why the supply men have taken a prominent part in the discussion of the railway question is indicated by the fact that in the three years ending December 31, 1907, the total number of freight cars ordered was 803,341, an average of 267,780 a year; while in 1908 the orders were but 62,669, and in 1909 but 189,360; and this year they probably will be no larger than they were in 1909. The railway supply men have been amply justified, as a measure of self-preservation, in opposing further unfair regulation of railways, for it has hurt and is hurting them more than it is the railways.

Continuing, the Illinois Manufacturers' Association says: "In your business and in mine we are forced by our competition to make up the losses of bad management and theft from our surplus, if we are so fortunate as to have one, or dig into our pockets for more capital. We cannot meet such exigencies by advancing prices to our customers." The following is from the Bulletin of the Bureau of Labor for March, 1910: "Wholesale prices in March, 1910, were higher than at any time in the preceding 20 years, being 7.5 per cent. higher than in March, 1909; 10.2 per cent. higher than in August, 1908; 21.1 per cent. higher than the average yearly price of 1900; 33.8 per cent. higher than the average price for the ten years 1890 to 1899; and 49.2 per cent. higher than the average yearly price of 1897." It is perfectly well-known and indisputable that the manufacturers of Illinois did their full share in making these advances in prices. Compare the foregoing with the following regarding railway rates for the same years, except for 1910, the official figure for which is not yet available: The average rate per ton per mile in the year ended June 30, 1909, was 7.63 mills, or 1.19 per cent. higher than in 1908; 4.66 per cent. higher than in 1900; 9 per cent. *lower* than the average rate for ten years, 1890 to 1899; and 4.38 per cent. *lower* than the average rate of 1897. Isn't it a shame how the manufacturers are prevented from raising their prices, while the railways are ruthlessly raising their rates!

In another place the Illinois Manufacturers' Association says: "We are not disposed to give advice or to criticise"; and then it proves it by adding, "but we do feel that if the methods which are employed by the manufacturers of this state in the management of their plants were applied to the railways the savings would be so great that the stockholders would be simply overwhelmed." No one will question that the manufacturers of Illinois are supermen. However, it is worth noting that Harrington Emerson, whose testimony in the rate advance hearings at Washington in criticism of the management of American railways has been so widely quoted, said, in reply to a question as to how much difference there is between the efficiency of the management of railways and other industries: *"The railways are fully up to, if not ahead of, the average ability."* There is one respect in which the figures we have given show that the managements of the railways are utterly inefficient as compared with those of the manufactories of Illinois and other states. While the manufacturers and jobbers, between them, were boosting wholesale prices 49.2 per cent., the railways were reducing their rates 4.38 per cent. If the managements of the railways were as efficient in raising rates as the managements of manufacturing concerns are in raising prices, we have no doubt that the stockholders of the railways would be "simply overwhelmed."

In another part of its report the Illinois Manufacturers' Association says, referring to the frauds in the car department of the Illinois Central: "It is not just to say that because such practices are common among the officials and employees of one road the same is true as to all, *but how many of us are there who can relieve our minds entirely of that suspicion?*" The large meat packing concerns of Chicago all belong to the Illinois Manufacturers' Association. They and their individual officers are under indictment for having entered into a conspiracy and combination in restraint of trade in violation of the Sherman act. At least two of the car repair concerns that are charged with having been in collusion with officers of the Illinois Central in defrauding that road are, or were at the time, members of the Illinois Manufacturers' Association. Now, in view of these facts, let us paraphrase the foregoing statements of the Illinois Manufacturers' Association: "It is not just to say that because some members of the Illinois Manufacturers' Association have been guilty of such criminal and dishonest practices, the same is true as to all, but how many of us are there who can relieve our minds entirely of that suspicion?" It would be libelous for us to reason and speak thus about all the members of the Illinois Manufacturers' Association. And it is just as libelous for this association to imply in a public statement that because the vice-president, general manager, general superintendent, superintendent of the car department and general storekeeper of one road have been, as is alleged, guilty of frauds against that road, the vice-president, general manager, general superintendent, superintendent of the car department and general storekeeper of every other railway in the country are open to the suspicion of having been guilty of similar practices.

The statement regarding railways and railway management which we have been analyzing is typical of those which have been emanating from the same source for years. It seems that no falsehood regarding railway management is too glaring; no misrepresentation too injurious; no slander too outrageous, for it to father and publish to the world. How much longer will the railway supply manufacturers of Illinois continue to contribute to the support of an organization which takes their money and uses it to injure their patrons and themselves? How long will the public continue to read and believe its reckless misrepresentations? And, finally, how much longer will the self-respecting manufacturers in general continue to permit the machinery of their organization to be prostituted to such uses?

SOUTHERN PACIFIC

THERE are only three railway companies in the United States earning more than $100,000,000 gross. The Pennsylvania Railroad is one and the Southern Pacific Company and the Atchison, Topeka & Sante Fe are the others. The Pennsylvania Railroad's development has been intensive; the Southern Pacific's and the Atchison's development have been extensive. Operating through Louisiana, Texas, New Mexico, Arizona, California, Oregon, Nevada and Utah, the Southern Pacific carries a more diversified tonnage than any other large railway. It is almost unique, for instance, amonge large railways, in that of the total tonnage carried but 2.91 per cent. is bituminous coal. Notwithstanding this characteristic of being an agricultural road as contrasted with a manufacturing road, the tonnage of products of agriculture amount to 19.83 per cent. of the total tonnage, while products of manufactures amount to 17.17 per cent.

The plant itself, originally a collection of more or less cheaply built scattering lines, has been brought up to modern standards through expenditures for maintenance and additions and betterments, made largely from income. About 63 per cent. of the main line is laid with 90, 80 and 75-lb. rails.

The fiscal year ended June 30, 1910, was the culmination of one period in the development of the property. For three years previous, month after month the earnings statement given out by the management came as a fresh cause of wonder to investors and railway men who were not closely in touch with the work of the Southern Pacific management. With few exceptions, each month showed an increase in gross over the corresponding month of the year before, and, counter to established precedent, net increased in greater proportion than gross. Since June 30, 1910, there has been a falling off in gross earnings, without a corresponding decrease in operating expenses. A second glance at the names of the states through which the road runs is sufficient explanation of the rapid increases in gross. The total increase in population of the eight states during the census decade from 1900 to 1910 was 2,600,000, an increase of 38 per cent. over 1900; and it is safe to say that in California, and in some of the other states, the territory tributary to the Southern Pacific has developed more rapidly than the average for the rest of the states.

In the year ended June 30, 1910, total operating revenues of the Southern Pacific amounted to $124,500,000, an increase of $13,700,000 over 1909. Operating expenses amounted to $73,500,000, an increase of $6,300,000. After the payment of fixed and other charges, the company had a surplus of $35,500,000 available for dividends. This is at the rate of over 13 per cent. on its outstanding $272,700,000 stock. It should be noted here that there is one source from which the company derived extraordinary revenue in 1910. Through the declaration of an extra dividend on the Wells-Fargo stock owned, which brought the Southern Pacific a little less than $5,000,000, the surplus mentioned above was increased to an extraordinary degree by "other income." Subtracting this $5,000,000 the company earned over 11 per cent. on its stock.

In making an analysis of the operations of a railway company to determine the value of the common stock, it is customary to show a normal maintenance per mile of line and per unit of equipment, and to credit the excess spent by a given company as an equity enjoyed by the common stock. These equities, which are very large indeed in the case of the Southern Pacific, are probably the cause when taken in connection with the unusually efficient operating organization that has been developed, of the ability of the Southern Pacific to save a good part of its increases in gross for net. Stated differently, the fact that the Southern Pacific spends on an average $3,000 per locomotive for repairs, $900 to $1,000 for passenger-train cars and over $100 for freight-train cars, and has spent sums almost as large in each of the past few years, does not mean that next year or the following year the equipment will be in such good shape that it will be necessary to spend only $2,000 for repairs of locomotives, etc.; but what is actually the case is that the roadbed and the equipment of the Southern Pacific are kept in such high state of efficiency that *transportation* expenses can be kept well in hand, even in the face of heavy increases in business handled. This statement is borne out by an examination of the details of operating expenses. In 1910 expenses for "maintenance," which include maintenance of way and maintenance of equipment, increased $2,990,000, or 10.36 per cent.; while expenses for "operation," which include transportation expenses, traffic expenses and general expenses, increased 8.70 per cent. An increase in the cost of labor and of materials affects both the cost of operation and the cost of maintenance, and in fairly equal degree. Increases in ton mileage and passenger mileage, unaccompanied by greater efficiency in operation, increase the cost of "operation" out of all proportion to the increase in cost of maintenance. This is obvious if an extreme example is taken by way of illustration. If the freight density on a given mile of road were doubled, the cost of maintenance of way of that mile might conceivably increase 20 to 25 per cent., but would certainly not increase 50 per cent. To handle twice as much traffic, even when applying the law of decrease in cost, would necessitate 80 to 85 per cent. more car mileage and train mileage, with corresponding increase in the cost of train crew and fuel.

To take a concrete example of the economics that may be

effected through efficiencies of operation and perfection of roadbed and equipment from the 1910 report of the Southern Pacific: Revenue passengers carried one mile increased by 250,000,000 over 1909. This is an increase of 17.17 per cent. The mileage of cars in passenger service increased 16,400,000, an increase of 12.32 pr cent. over 1909. Tons of revenue and company freight carried one mile increased 758,000,000, an increase of 10.51 per cent. over 1909. Locomotive mileage, with freight and mixed trains, increased 1,400,000, or 7.16 per cent., over 1909. It is this potential saving in operating costs that is the real equity created by the expenditures of more than "sufficient" sums for maintenance.

The following table shows the unit costs of maintenance in 1910 compared with 1909:

	1910.	1909.
*Maintenance of way and structures per mile	$1,612	$1,474
†Repairs per locomotive	3,343	2,973
" " passenger-train car	1,032	910
" " freight-train car	109	104

* Per mile of all main tracks, excluding siding and switch tracks.
† This is for repairs only, and does not include renewals, depreciation or superintendence charges.

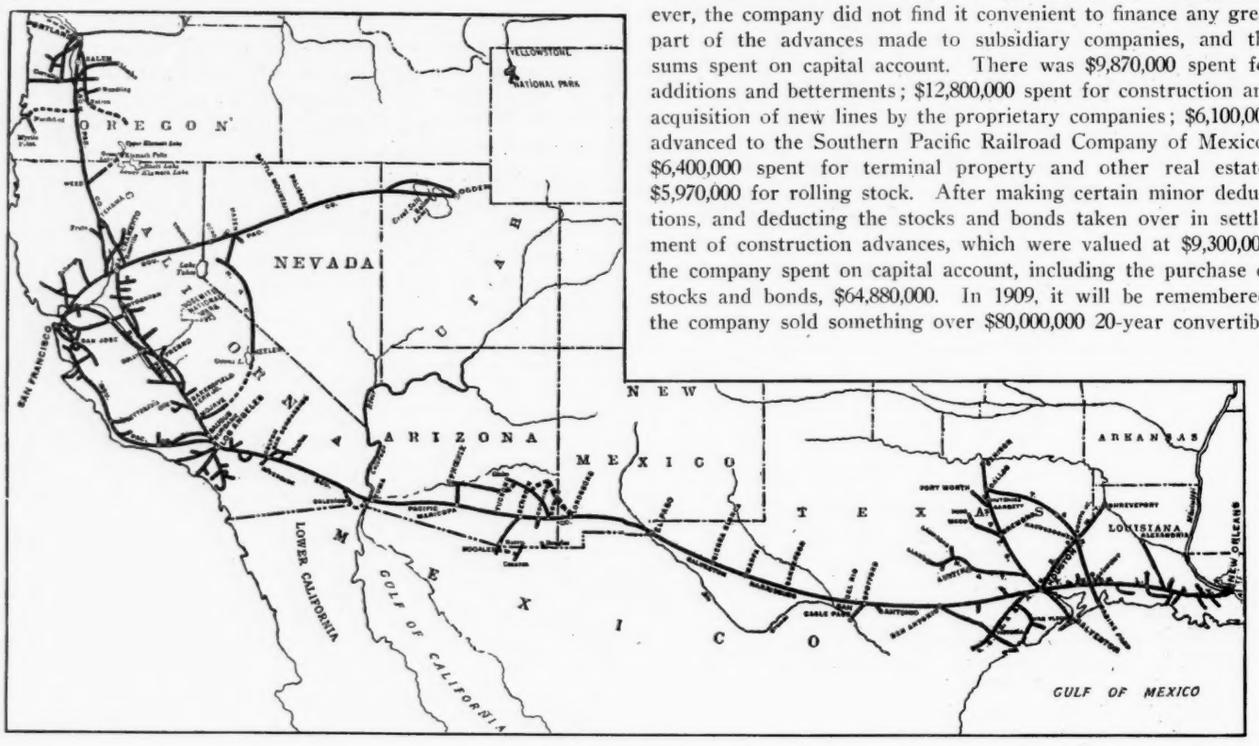
A larger proportion of total revenue is derived from passenger-traffic on the Southern Pacific than is the case with most large roads. In 1910 the company earned $40,200,000 from passengers. This is an increase of $5,900,000 over 1909. The revenue passengers carried one mile totaled 1,806,000,000. The average revenue per passenger per mile was 2.188 cents in 1910 and 2.185 cents in 1909. The average distance each passenger was carried was 44.93 miles last year as compared with 39.18 miles the year before.

Revenue from freight amounted to $77,000,000 in 1910, an increase of $7,100,000 over 1909. The tons of revenue freight carried one mile totaled 6,629,000,000, an increase of 572,800,000 tons. The average receipts per ton per mile amounted to 1.162 cents last year and to 1.154 cents the year before. The average length of haul was 243.42 miles in 1910 and 256.52 miles in the year 1909. This is a long average haul, with a high average ton-mile rate.

The high ton-mile rate is accounted for by the comparatively small amount of low grade traffic, and by the comparatively large proportion of perishable and other classes of freight which move on a fast time schedule and in consequence take a high rate.

In 1910, of the total 25,692,704 tons of revenue freight carried, 27.68 per cent. was products of mines; 21.12 per cent. was products of forests; 19.83 per cent. was products of agriculture; 17.17 per cent. was manufactures; 10.18 per cent. was merchandise and miscellaneous; and 4.02 per cent. was live stock and animal products. In 1910, 1,900,000 tons of fruit and vegetables were carried. This is 7.37 per cent. of the total tonnage carried and is an increase of 219,000 tons, or nearly 13 per cent., over the tonnage in 1909. There is a notable increase in the tonnage of manufactures. In 1910 this tonnage totaled 4,460,000, an increase of 781,000 tons over 1909. A good indication of the industrial activity in the territory served by the Southern Pacific is shown by the fact that the railway carried 1,569,000 tons of cement, brick and lime, an increase of 345,000 tons, or 28 per cent. over 1909; and the tonnage of stone, sand and like articles totaled 1,140,000 tons, an increase of 856,000 tons, or about 67 per cent.

To finance its extensive improvements and new lines, the Southern Pacific is necessarily a heavy borrower. In 1910, however, the company did not find it convenient to finance any great part of the advances made to subsidiary companies, and the sums spent on capital account. There was $9,870,000 spent for additions and betterments; $12,800,000 spent for construction and acquisition of new lines by the proprietary companies; $6,100,000 advanced to the Southern Pacific Railroad Company of Mexico; $6,400,000 spent for terminal property and other real estate; $5,970,000 for rolling stock. After making certain minor deductions, and deducting the stocks and bonds taken over in settlement of construction advances, which were valued at $9,300,000, the company spent on capital account, including the purchase of stocks and bonds, $64,880,000. In 1909, it will be remembered, the company sold something over $80,000,000 20-year convertible 4 per cent. bonds. The proceeds from all but $1,000,000 of these bonds were received before the beginning of the last fiscal year. The company began 1910, therefore, with a large amount of cash on hand. During the 1910 fiscal year the preferred stock was called for redemption, and holders were given the option of receiving cash at the rate of 115 per cent. or of exchanging at par their preferred for common stock; and the annual report shows that almost the entire amount of preferred stock was converted into common stock, so that the total amount of stock outstanding was nearly the same at the end of the year as at the beginning. The company sold $25,000,000 San Francisco terminal first mortgage 4 per cent. bonds, but only $15,000,000 of these bonds are taken in the 1910 account. On June 1, 1910, $7,253,000 2-5 year 4 per cent. mortgage bonds were paid. The net increase, after the issue of various amounts of bonds for

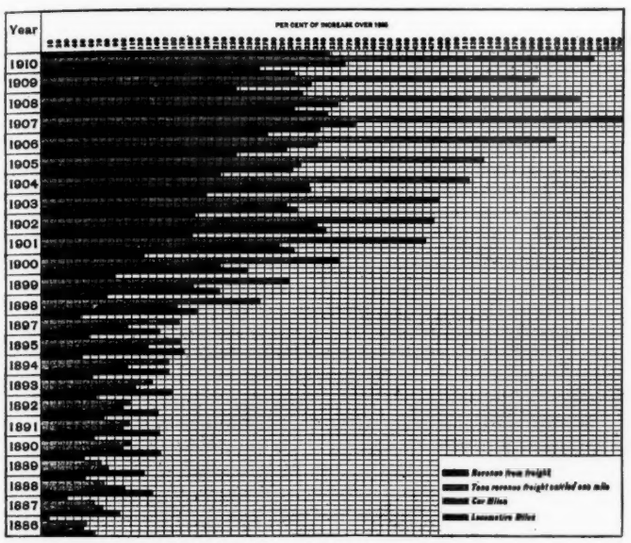


Southern Pacific.

The Southern Pacific lines in Mexico are not shown on this map.

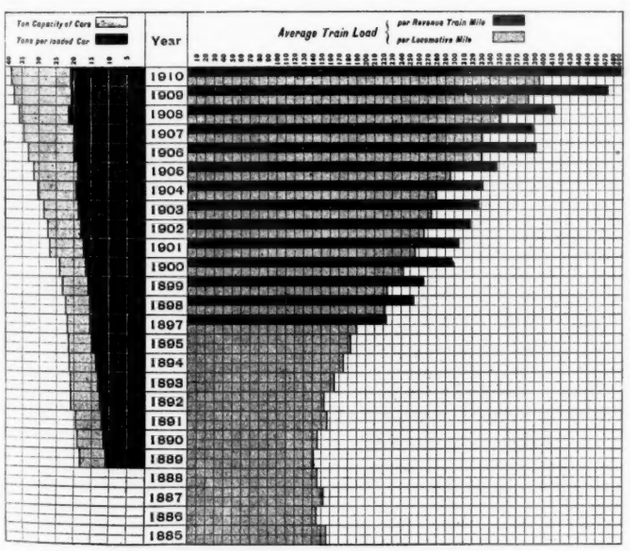
refunding, etc., in bonds issued during the year was $11,460,000.

The balance sheet gives this same information in a different form. Current assets amounted to $49,600,000 in 1910, which included $10,700,000 cash. In 1909 current assets amounted to $60,950,000, which included $31,800,000 cash. The book value of stocks and bonds of proprietary and other companies unpledged,



Increase in Freight Service.

and advances to construction and other companies, all show large increases in 1910 as compared with 1909. While current assets decreased by $11,400,000, current liabilities increased by $12,900,000, and amounted in 1910 to $36,000,000. These current liabilities include $10,900,000 borrowed from the Union Pacific. Since the accounts for 1910 were closed, the Southern Pacific has presumably received the remaining $10,000,000 on the $25,000,000 San Francisco terminal first mortgage bonds; but $10,000,000 does not go far with a company dealing in such large sums as the Southern Pacific, and with needs for financing construction



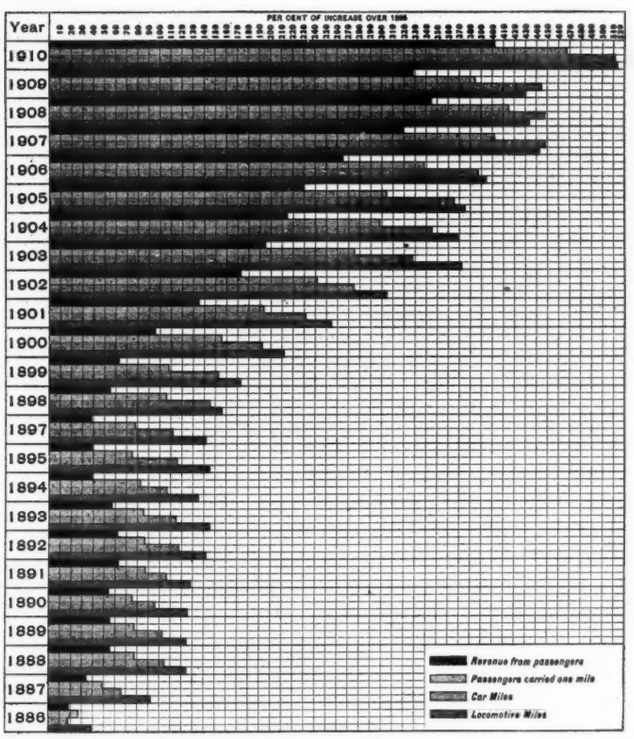
Average Train Load 1885 to 1910.

on such a large scale, as is being done in Mexico. It would appear, therefore, that under favorable conditions the Southern Pacific will probably do considerable financing in the near future.

The Southern Pacific had on June 30 a credit of $54,760,000 to profit and loss. One considerable source of profit during the past year was the sale of the Southern Pacific's minority holdings of Wells-Fargo & Co. Express stock. After the payment of the extra dividend previously mentioned, the Southern Pacific found a favorable opportunity for the sale of its express company stock, and also sold its holdings of the Mexican international Railroad to the National Railways of Mexico. The profit on these two sales amounted to over $7,000,000.

The construction work that is under way by subsidiary companies of the Southern Pacific is described in our General News columns.

If we could apply the principles of rhetoric to the criticisms of an annual report, it would be proper to say that the Southern Pacific's report has unity, mass and coherence to an unusual degree. Not only is the report comprehensive—and when it is said of a statistical statement of such great operations as are carried on by the Southern Pacific that it is comprehensive, it is high praise—but the report has an arrangement and a structure that one might expect to find in a well written essay. To illustrate by a single detail: The table showing transportation operations is a complete exhibit in itself. In order, the mileage operated, the revenue, the expenses, the volume of business and



Increase in Passenger Service.

the essential unit figures for volume of business are set forth logically in a simple form.

The following table shows the operations of the Southern Pacific Company and proprietary and non-proprietary companies given in the form usually followed in these comments on annual reports:

	1910.	1909.
Average mileage operated	9,752	9,626
Freight revenue	$77,018,554	$69,878,880
Passenger revenue	40,244,856	34,345,339
Total operating revenues (rail lines)	124,523,905	110,846,404
Maint. of way and structures	16,098,705	14,533,135
Maint. of equipment	15,808,391	14,379,762
Traffic	2,481,186	2,069,940
Transportation	35,658,046	32,846,193
Total operating expenses (rail lines)	73,514,034	67,191,875
Taxes	4,519,374	3,788,242
Operating income	47,238,385	40,937,534
Gross corporate income	57,947,565	46,135,256
Net corporate income	35,463,218	36,879,402
Dividends	17,238,347	17,336,974
Surplus	18,178,549	9,477,966

Letters to the Editor.

RAILWAY CAPITALIZATION.

December 20, 1910.

To the Editor of the Railway Age Gazette:

The articles by Prof. Ripley on railway capitalization are very valuable as showing an appreciation of the facts concealed by the misleading form in which the statistician of the Interstate Commerce Commission casts his statistics; but they are marred by the prevailing bias against the railways and seemingly reflect a personal rancor against the personality of the late Mr. Harriman.

In his discussion in your issue of October 28, 1910, Prof. Ripley says:

"Yet a bald comparison of expenditures for maintenance of way and equipment per mile of line would be unfair. The need for such outlay varies, more or less, in proportion to the load of utilization. Maintenance, if compared, should be given in terms of density of traffic. Thus, in 1907, the Union Pacific expended $3,175 per mile of line for maintenance of way; the North Western expended only $2,333. *But the density of traffic of the Union Pacific road is 60 per cent. greater. Maintenance of way expenditure in terms of 100,000 ton miles of freight density are only $268 for the Union Pacific, against $324 for the North Western, per mile of line. Despite appearances, due regard being paid to density of traffic, the North Western is pursuing the more conservative policy of the two.*"

First. It has been sixty years since Lardner pointed out that something like one-half the cost of track maintenance was due to the effects of time and the weather. The Union Pacific lies, for the most part, in the semi-arid region and the C. & N. W. in a region of heavy rainfall. Is one to assume that this is not reflected in costs?

Or, take such an item as material. The Union Pacific is very heavily ballasted with the so-called Sherman gravel, a disintegrated granite, possibly the finest material for the purpose in the United States and ridiculously cheap. The C. & N. W. is rather lightly ballasted with sand and gravel recovered from the creek beds, burnt clay and broken stone of an inferior quality, is also used the poor and costly resources of a region of inhospitable geology. Should not one look to see this condition reflected in costs?

Second. The Union Pacific lies upon the smooth floor of the Platte valley, rising by gentle inclination to the foot of the Rockies; the North Western climbs out of the Missouri valley 1,500 ft. to an elevated plateau, which is badly broken up by deep water courses, to fall off again into the valley of the Mississippi.

If Prof. Ripley will examine two hundred miles of the New York Central between Albany and Buffalo and compare it with two hundred miles of the Pennsylvania or Baltimore & Ohio, between Philadelphia and Pittsburgh, and will study the effects of these locations to the country side on the cost of track maintenance, he will appreciate such differences. A line built across Boston Common and one from Boston to Springfield do not present so great a contrast as do the two which he puts on an equal footing.

Third. Since Mr. Woodlock began the use of certain units of comparison in his discussion of the annual reports of railways in the *Wall Street Journal*, they have been used in many ways he must have been far from contemplating. One of the most common errors of his imitators is to assume that, if Line A spends $1,000 per mile in maintenance, and Line B $1,200 per mile, Line A has been starved, or this may be varied by assuming that Line B is being improved by a diversion of earnings and that a hidden equity is being created. Now, the fact may be that all that is indicated is the difference between, on the one hand, a slovenly housekeeping and, on the other, a painstaking, saving housekeeping. The effect of such unintelligent criticism must eventually tend to discourage good effort and promote incompetence.

Now, in the comparisons of the expense of maintenance of way, the effect of such considerations as the above, and others that might be enumerated, which, moreover, may in some cases be cumulative, are so great as to account in themselves for very wide spreads and to warrant a call for supporting facts when sweeping criticisms are brought forward by people of responsibility.

I have recently been over the line of the Union Pacific and of the Chicago & North Western. There is no question at all of the superior condition of the Union Pacific track. I do not want to be understood as disparaging the track of the Chicago & North Western; it is very good indeed, but, to bring it up to the condition of the Union Pacific, if, indeed, under the circumstances, that be possible, would be economic waste.

I must conclude that the opinion of Prof. Ripley, "Despite appearances, due regard being paid to density of traffic, the North Western in pursuing the more conservative policy of the two," is the careless dictum of the "closet philosopher" and, in view of other expressions in his article, wonder whether it owes its genesis to a desire to reflect on Mr. Harriman. PRESIDENT.

RAILWAY "MONOPOLY" AT CONNECTICUT PORTS.

New Haven, Conn., Dec. 15, 1910.

To the Editor of the Railway Age Gazette:

I thank you for consideration given to my previous letter. The privilege of making one or two corrections of your comment is requested. It was not my purpose to enlarge on the fact that independent boat lines on the Great Lakes are inefficient, though I had no desire to hide the fact; but, rather, desired to show what grand results can be brought about when railway interests and water traffic affiliate. The absorption of the different railway lines as well as boat lines running to and from Connecticut ports by one company would not be objectionable if the acquisition of additional harbor properties were made for the purpose (as you say) "of extension, new trackage and general addition to the terminal plant"; but unfortunately for the ports this is not true. You say further on, "Sometimes the property has been improved, sometimes not, according to the exigencies of the controlling railway corporations."

New Haven's condition shows an improvement on 1,200 ft. of dock property by the railway company, and the practical abandonment (you inadvertently substituted the word "abundant" for "abandoned" in my previous letter) by the railway company of more dock property formerly used than all that is now used, both by the railway company and private interests combined.

In calling attention to the large amount of harbor frontage in New Haven you lose sight of the fact that consignees will pay demurrage on cargoes of lumber which have to be hauled in order to place their cargoes when the shortest possible distance has to be covered. This being true, the improvement of other property than that owned by the railway company would be a useless waste of money.

The whole subject can be covered in a few words. The railway company has by arrangement of rates diverted coal and lumber from water to all-rail routes (and at an admitted loss), so that greater terminal facilities are not required; and the disposal of any portion of this unused railway property to private parties would indeed be an innovation.

In reference to Bridgeport your statement that the "New Haven company owned 4,440 ft. on the outside below the railway drawbridge" is true; and that 4,440 ft. would be worth more to Bridgeport proper than all the rest of the dock property now used. Dock property is one thing, but dock property, properly located, is quite another proposition.

New London has no dock connection with the New Haven road. An excellent dock built by the Eastern Shipbuilding Company, bought by the railway, could have been used for terminal purposes; but it was deliberately disposed of. Why?

E. S. DOWE,
President, New Haven Towing Company.

RECENT DEVELOPMENTS IN SIGNALING.

BY A. H. RUDD.*

In the past five years electric traction has been rapidly developed, telephones have been substituted for telegraph in many sections, locomotives of higher power and cars of larger capacity and increased strength built, air brake efficiency improved, greater attention than ever before given to the manufacture of rails, the improvement of fastenings, preservation of ties, and the general betterment of the permanent way, but in no branch of railway engineering and operation, except in government regulations, has such a revolution been accomplished and such progress made as in the signaling of the trunk lines of America.

The development of the motor signal operating at low voltages, and particularly of the top post mechanism applying the power directly at the point required, has enabled us to place our distant signals at a sufficient distance to give proper advance warning to approaching fast trains, while removing the danger of maladjustment inherent in the old wire-connected signals; while electric back locks insure against dangerous complications in the rare event of false clear failures. Approach locking insures against errors of practice, in the event of an attempt on the part of a signal operator to change a route after clear signals have been displayed. In the automatic field improved apparatus has reduced failures, and, notably, the development of alternating current apparatus has practically eliminated that class of false clear indications, due to stray currents closing the track relays (which are the basis of operation of all improved automatic work), at the same time providing more rugged mechanism, as near as we can estimate, probably cutting down operating expenses considerably, if the same energy is used to operate and light signals, dispensing as it does with the care of oil lamps and storage or primary batteries.

The development of manual controlled block systems has enabled us to operate entirely by signal, without the use of train orders, on single track, with practically the same safety as is insured by the employment of the staff, or staff and tablet system, but without the delays made necessary by these cumbersome methods, thereby greatly increasing our facility of movement.

The perfecting of electric and electro-pneumatic interlocking has made possible the control of signals and switches a mile or more from the center of operation, and this has required in turn the development of electric route locking, so that not only are switches prevented from moving immediately under trains, but are locked by the approach of a train throughout its entire route to the next signal, and are released in turn immediately on its passage, and this is accomplished by a simple method, in either direction, depending upon the direction of movement of the train —that is, if a signal is cleared for an eastbound train, the entrance of such a train upon such a route will hold all switches in front of it and release them as it passes, and the clearing of a signal for a westbound train will lock all switches in the route, and the train will release them in reverse order on its passage. This development has added tremendously to the safety of our large terminals, and, incidentally, as the track circuits are installed, they have been utilized to introduce the semi-automatic feature in terminal stations, by which all signals are restored to the normal position by the passage of the train, a still further safeguard, utterly out of all question ten years ago, and attempted with trepidation first, I believe, on the Pennsylvania Railroad some four years ago.

It is not my intention, however, to enlarge upon the engineering features of the profession this evening, which require that a well-equipped signal engineer shall be a good mechanical and a good electrical engineer in one, but it is rather my aim to set forth a few of the problems involved in the indications to be given and the aspects to be displayed to the engineman, the mastery of which makes it requisite that a signal engineer should also be a mighty good transportation man, and, finally, considerable of a psychologist.

The disk signal, requiring very little force for its operation, was the first type of automatic signal. Broadly, it consisted of two kinds, the simple magnet and the clockwork. The well-known Hall disk was the simplest probably ever designed, consisting of a magnet and a rotating armature. A number of roads, pioneers in automatic signaling, being equipped with such signals before the motor signal was perfected, have continued the installation of such types, but the general trend on most roads is to supplant them by semaphore signals. * * * The fact is recognized that the semaphore is a favorite to such an extent that any scheme for a system to be universally adopted must be founded upon it as a basis.

About 12 years ago the yellow light was developed for the night caution indication, and since then almost half the mileage of the United States and Canada has adopted green for the night clear indication in fixed signals, and all but two or three roads comprising this mileage are using yellow for caution.

The upper-quadrant arm has only been strongly advocated during the past five years, and on February 1, 1910 (the last date at which I compiled the information), out of 255,357 miles of roads in the United States and Canada, I found as follows:

	MILES.
Lines of road on which it was adopted for all new work and renewals	69,634
Lines on which it was used in part	16,152
Total	85,786

while lines of only 65,520 miles advised they contemplated no change, leaving 12,000 odd considering the change and 92,000 miles not reporting. Since then the movement has advanced rapidly, and it is safe to say that nearly half the total mileage referred to will instal the upper quadrant for new work and renewals in the next year or two. Without question, this common-sense arrangement will eventually be universally adopted.

Closely connected with the movement for the use of the upper-quadrant is the adoption of what is known as three-position signaling.

At interlocking our practice is, I believe without exception (at least in the United States), to have the top arm govern the main running track, and the second, and sometimes the third, fourth, and fifth arms, to govern to diverging tracks, while on thick lines where automatic signals are used the home block signal is the top arm and the distant for the next home signal is mounted below it, so that at interlockings one arm governs the sraight track, and at the block signal two arms must be observed together. Further, at interlockings where advance signals are used, it is the practice, if the advance signal is at stop, to show caution at the distant and clear at the home, which has led to disaster. Both these conflictions in practice are remedied by the use of three-position signaling. Only one arm is used on the automatic signal, except when it is also used as a distant for an interlocking, and arms are only added where divergences occur, as at interlockings. All lights except the governing ones are red, so that two lights do not give conflicting information concerning the movement to be made. The arm at horizontal (red light) indicates stop; inclined upward 45 degrees (yellow light) indicates next signal at stop; and upward 90 degrees (green light) proceed, next signal at caution or proceed; in this way governing trains by the position of the arm rather than by its shape, a decided improvement over the present practice, in which a fish-tail arm horizontal means caution and a square end arm stop, the shape being difficult to distinguish at high speeds.

So far, we have regarded a single arm as the entire signal, as does the standard code, which provides no indications or aspects for "diverge from the main track." Obviously, therefore, it is incomplete.

In practice, of course, as previously stated, we have a multiplicity of arms. Many roads attempt to signal routes; others cover all diverging routes by the use of one additional arm. This carries with it a reduction of speed, and while not so stated

* Signal engineer, Pennsylvania Railroad. From a paper read before the Canadian Railway Club, Montreal, November, 1910.

in orders, etc., we have really for years been using at interlockings what is known as speed signaling—that is, top arm for main track (high speed), second arm for diverge (low speed), for it is obvious that with such an arrangement it is only safe to permit a speed which will be safe and proper by the most unfavorable route. When such a signal governs to main running passenger tracks and also against the normal current of traffic, or into sidings, and is habitually used by high-speed trains, the habit gradually forms of running at higher than the authorized speed, and if sometime a different route is set, serious results may ensue. This is particularly the case when long cross-overs or turn-outs are installed, over which a movement at 40 to 50 miles an hour is permissible, hence the practice is rapidly developing of using, at points where the routes may be changed, as at interlockings, three arms, the top one for the through high-speed route, the second for the medium-speed route (that is, over Nos. 15 to 20 cross-overs and turn-outs), and the third arm for low-speed routes, giving it clear if the route is set over a short turn-out to a main running track, with next signal in the route at proceed, if within braking distance, and in the caution position if the train may only proceed through the interlocking limits. An additional function is also given to this arm in the caution position, namely, that of admitting trains to an occupied track within the interlocking limits, using it in lieu of the hand signal required by present practice, if the signals are semi-automatic, and thus assuring the runner that the switches are properly set and locked. It has been the general practice to space the upper arms about 6 ft. apart, and the lower arm about twice that distance below the second arm. It is now recommended by a committee of the Railway Signal Association to have the spacing approximately equal, in which case it will probably be advisable to make the lower light of a color other than red for greater distinction.

A general rule requires that a train must stop if a signal is improperly displayed, or if a signal is not displayed where one should be shown, but this rule is difficult of enforcement. For instance, if one, two, three, or perhaps four lights should be displayed, and one is extinguished, an engineman must think quickly to keep out of trouble. He may mistake a four-light signal, with the top light out and the second light clear, as a clear main track signal, etc. Again, if it is a one-light signal, and that light extinguished, the particular spot of darkness at which the train should stop is not easily located. In the present satisfactory development of signal lamps, cases of extinguished lights are rare; but they do occur, and it is generally felt that an engineer should have two chances, as the extinguishing of both lights in any one signal is very unusual, unless electric lights are used. Again, it is felt that if the same number of lights were displayed on every signal, the absence of any of the lights would be instantly detected. The ideal for economy would be one light on each signal, but obviously this is impracticable. The ideal for safety would be so many lights that at least one would always be burning. On the other hand, the cost of equipping each switch target with two or three lights would be prohibitive. As a compromise, the following has been suggested and put into effect more or less completely on a number of roads, with the hope that eventually the various practices may develop into a uniform system:

Facing switches on high-speed tracks to be equipped with high distant switch signals having two lights.

The switch-stands themselves to be short and equipped with one light.

All high signals to have two lights of long range, the low-speed arm to be equipped with a short-range light.

This will, in effect, result in two lights on all high signals governing high-speed trains, and one light on all low signals governing low-speed trains.

Taking advantage of this principle, the signals are divided into three clases: "Stop and stay," "Stop and proceed," and "Stop and investigate." Under "stop and stay" are classified all manual block and interlocking signals, the two lights being placed one above the other and the arms square-ended. Under "stop and proceed" are classified distant signals of all kinds (which require no stop) and all automatic signals, at which the train must stop and if the way is seen to be clear may then proceed, the two lights being placed in a diagonal line, and the arms having ends pointed. Under "stop and investigate" are the switch targets and similar signals or signs. In order to differentiate between a red switch light, which may be passed after stopping, and a light at a dwarf signal or a derail which is open, which may not be so passed, it is proposed to make these latter purple for the stop indication. By the use of this color also dwarf signals will not be mistaken for train tail lights or flagmen.

It is further proposed to make the siding and yard switches lunar white when set for ladder or straight track, and yellow for the reversed position, retaining the red and green for main line indications. There remains still to be provided a permissive signal and a block office closed sign. Several roads, notably the Pennsylvania, give a permissive signal in manual block territory, which permits their heavy freights to enter an occupied block without entirely stopping. At present this is given by the home or advance signal in the caution position, but it is felt that such diverse information all conveyed by one aspect is confusing, and that some other means should be adopted. It is proposed to use, instead of the yellow light alone, a reflecting lamp showing yellow and lunar white in a horizontal line about 1 ft. apart on centers, with a circular disk attached to the blade.

There are in use several schemes for designating "block office closed." Arms are cleared and lights extinguished, or arms are cleared and lights left burning, or arms are left at stop and lights extinguished, and when permissive block is operated, confusion is avoided only by the use of established rules. In order to carry out the idea of having the signal itself indicate the conditions, it has been proposed to use removable arms, and, when the office is closed at night, to display two lunar white lights on a horizontal plane, about 2 ft. apart, on the signal mast.

It will be seen from the foregoing that the aspect of the signal has been considered in its entirety, as presented to the engineman, rather than in its component parts, as treated in the Standard Code, and much thought has been given to the problem of so arranging it that two separate signals located close together may not be read as one signal, giving different information.

For the past five years Committee No. 10 of the American Railway Engineering and Maintenance of Way Association has been working on this subject of aspects, and until a year or so ago was most harmonious. Since then some of the members operating their railways have felt that, while the system outlined was applicable to the trunk lines east of Chicago, it was too elaborate and expensive for their own requirements. They differ from the majority of the committee substantially in only two fundamentals. First, they believe there should be only four indications: "stop and stay," "stop and proceed," "caution," and "proceed," caution covering "train in block," "diverge from main track," "next signal at stop," "bad track ahead," or any other condition where caution is required. This would mean that any train receiving a caution signal must reduce speed at once and proceed at low speed, looking out for some danger or stop signal ahead, and be absolutely restricted as to speed until the next signal was reached, regardless of what the conditions actually might be. For instance, even if the route was set over a long cross-over with the next signal clear (a route which could safely be taken at 45 to 50 miles an hour), the train must crawl along because the same signal at the same place might, next time, indicate the train was headed into a siding or an occupied main track.

In the minds of the majority, this practice would restrict train movement, while our desire is to facilitate it as much as possible by the use of signals, and not to tell an engineman to use caution when it is not required; for it is human nature, if we are told day after day to run cautiously, and find no reason for such re-

striction, to take it for granted that the conditions are as usual, and "hit her up," rules to the contrary notwithstanding.

Our object is to so arrange the signals that they may accord with the rules to such an extent as to make the observance of the latter almost instinctive, rather than requiring an effort of memory under varying conditions.

The second fundamental [of these west-of-Chicago men] is that one signal governs only to the next, and that, if a distant signal shows clear, the engineer is not thereby told that it means proceed, next signal at proceed, but rather that it may be at stop. The logical result of this is that a distant signal at caution would mean "reduce speed at once and look out for immediate trouble," and a distant signal at clear, "proceed, prepared to stop at the home signal, which may be against you." That is, of course, if the road is operated on a conservative and safe basis. With one-mile blocks and trains scheduled at 60 miles an hour, how many would make time?

The fact that several roads have adopted the principal aspects suggested by the committee and that they are operating successfully, having the testimony of their enginemen that former confusion is eliminated, and that the new system is easier to learn and remember than the old, is sufficient refutation of the plea that it is so complicated that no one can learn it, and the conclusion of a majority of the committee is that the new scheme is applicable to lines of either heavy or thin traffic; tells the engineer the truth, relieves him of the tension of continually guessing what "caution" means at each particular place, and, finally, not only safeguards traffic to a greater extent than formerly, but also expedites it to a degree before unknown.

The impression is abroad that the Pennsylvania and New York Central lines are great four-track trunks, rich and powerful, and that they can afford systems which would bankrupt the thin lines. I can speak for the Pennsylvania alone, and I can assure you that money for signaling is not easy to get, and that we have quite a mileage of other than four-track lines.

Let me read you a few statistics compiled within the past year:

Pennsylvania Railroad (including P. B. & W., N. C. and W. J. & S.)
Miles of Road Equipped with Block System.

	Miles of Road.	Automatic.	Non-Automatic.	Total.	Total Non-Block.
Single track	3,497	...	1,698	1,698	1,798
Double track	1,230	156	1,037	1,193	36
Three track	109	7	52	60	49
Four track	456	206	226	432	23
Total	5,294	370	3,014	3,385	1,908

Single Track Lines on which Block System Is Used, and Average Number of Train Movements Daily.

From	To	Miles.	Average daily movements one way.
Reading	Pottsville	36.0	15
Vail	Lock Haven	54.2	18
Vail	Osceola Junc.	19.2	8—11
Lewisburg	Bellefonte	58.4	3— 4
Columbia	Frederick	68.2	3— 9
Lewistown Junc.	Selinsgrove Junc.	44.6	5
Sodus Point	Stanley	34.0	5
Williamsport	Elmira	73.5	13—18
Hinsdale	Rochester	98.6	10—11
Oil City	Olean	113.6	15—16
Buffalo	Oil City	136.6	9—13
Driftwood	Red Bank	110.0	7—15
Perryville	Columbia	42.9	8— 9
Wawa	Oxford	31.0	9
Johnsonburg	Clermont	19.8	2
Ridgway	Falls Creek	27.2	5

It will be seen, therefore, that our conditions are not so different from those of other roads.

The points in dispute have been submitted for decision to the Committee on Transportation of the American Railway Association. It is expected it will reach a decision in the near future. If this is done, the report of the committees on Signaling of the Railway Signal Association and the American Railway Engineering and Maintenance of Way Association will doubtless be recast along the lines laid down by the Committee on Transportation, and it is to be devoutly hoped that the committee may get together and evolve a system which can be recommended by all three associations for adoption; and can be put in use on all the railways of the American continent, to the end that we may not only have uniformity and interchangeability of material with all its benefits of economy and quick delivery, but that our enginemen may run over our various roads, or shift from one road to another, without the danger of their encountering a new system, mistakenly interpreted perhaps, by sudden mental reversion to the old system of different meaning under which they had been accustomed to operate.

Answering a question Mr. Rudd said:

We have an installation of about 14 miles on the Western division, running west from Williamsport to Erie, of single-track manual controlled signaling. We have had it in service for some three years. We use the permissive block for following trains. While we could build a second track, the present location is not favorable, and the construction of a new double-track line would be very expensive. The system is so arranged that, if a train enters a block, no signal may be given in the opposite direction until the train clears the block, either by passing through or by entering a passing siding, and then only when the train is in to clear and the switch locked, but a permissive signal may be given for a following freight, absolute block being used for passenger trains. After a train is locked in on a siding it cannot get out until a following train has passed the switch, and the switch is unlocked by the operator, or until an opposing train has passed the meeting point. It is not, however, necessarily held on the siding until the trains referred to have passed entirely out of the block. It is practically the same thing that we are using between Broad street station and the Schuylkill river, Philadelphia, where we operate eight tracks in either direction. It seems to me it is a great development, and I do not believe our people would think of putting in a staff in place of this lock and block system.

VAN HORN-ENDSLEY SPARK ARRESTER.

In the self-cleaning smokebox the flow necessary to carry the cinders from the tubes and through the screen is created by contracting the passageway under the diaphragm, thus producing a high velocity. Of the so-called force created by the vacuum in the smokebox, practically one-third is used in drawing the combustion gases and cinders through the tubes, one-third is used in drawing them under the diaphragm plate, leaving but one-third to act as a combustion force in the firebox. The objections to present conditions in the smokeboxes of locomotives are a retsricted flow of air through the firebox due to the obstruction of the diaphragm and screen; the uneven draft whenever the screen becomes clogged through the nature of coal burned or moisture from a leaky flue; the escape of live cinders or sparks from the stack which are taken *prima-facie* evidence for large claims for fire losses which occur; the annoyance to passengers and the heavy wear upon the car seat and floor covering from the flying cinders.

The remedy for the troubles enumerated is almost entirely a question of a more direct, freer draft without plates and screens to obstruct it, but at the same time collecting the cinders so that none will be discharged from the stack.

The Van Horn-Endsley spark arrester is the final result of numerous tests using the centrifugal principle. The device was perfected in a dummy boiler at Purdue University, at Lafayette, Ind., and then through the courtesy of Robert Quayle, general superintendent of motive power of the Chicago & North Western, was placed on locomotive No. 395. This locomotive was taken to Purdue University and a series of runs made on the testing plant in July and September, 1910.

Numerous spark arresters have been invented and patented in the effort to kill the live spark or lengthen the path of travel to break up and deaden the cinder. The objection to them has been in the use of plates, screens and other obstructions to the draft which interfere with the steaming of the locomotive. The Van Horn-Endsley spark arrester has an open passageway for

the gases without a screen to clog or plates to deaden the draft. In fact the test runs indicate that the steaming power of a locomotive will be more uniform than with the present apparatus.

This new spark arrester, as shown in Fig. 1, has the usual exhaust nozzle underneath the smokestack, but located at the very front end of the smokebox. There is a spiral diaphragm immediately in front of the tube sheet. This directs the current of vents them falling into the current of gases flowing through the thimble to the smokestack.

Nearly uniform velocity is maintained in the flow of combustion gases and cinders through the tubes as is shown by the table (Fig. 2) taken from the tests made with the dummy boiler. It is expected that the spiral diaphragm will keep all the flues from clogging.

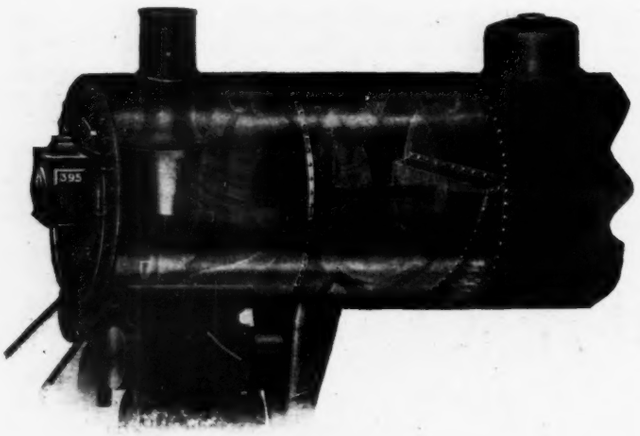


Fig. 1—VanHorn-Endsley Spark Arrester.

The illustration is lengthened to show the several parts; it is more compact in actual practice.

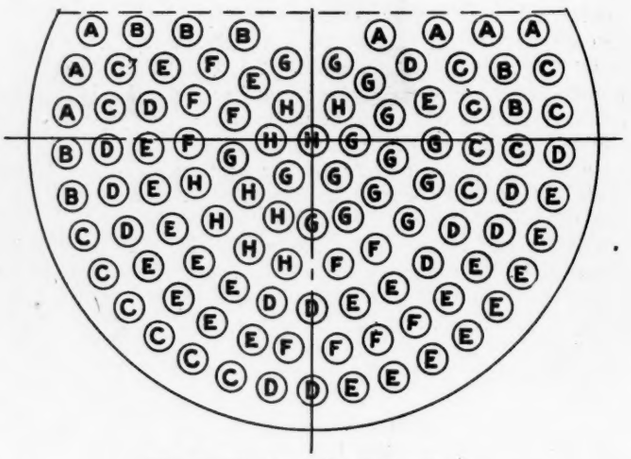


Fig. 2—Chart of the Tube Sheet.

Tubes Containing Letter.	Pitot Tube Readings in Inches of Water.	Velocity of Air in Feet Per Minute.
A	.7	3475
B	.75	3500
C	.80	3600
D	.85	3700
E	.90	3800
F	.95	3900
G	1.00	4000
H	1.10	4150

combustion gases around the inside shell of the smokebox. Through centrifugal action the cinders and heavy matter are thrown to the outside and follow the shell until they fall in the hopper at the bottom. At the lowest point of the diaphragm is an opening which allows the heaviest cinders to flow through and into the hopper without affecting the current of the large volume of gases. This avoids reducing the throat in the diaphragm in order to get a velocity great enough to carry all heavy cinders around the inner surface of the smokebox.

A baffle-plate is placed just behind the nozzle with a circular opening in the center. A thimble in this opening extends towards the rear. The baffle-plate will stop any of the lighter cinders that may not have dropped into the hopper, while the thimble pre-

In a locomotive the device can be built more compactly than is shown in Fig. 1, which is lengthened to better illustrate the several parts. Drawings are being made for a 61-in. smokebox. The proportions will be: From tube sheet to end of spiral diaphragm, 40 in.; middle chamber to baffle-plate, 20 in.; front chamber, 34 in.—total, 94 in. New construction and some types of locomotives will locate the hopper behind the saddle, as shown in Fig. 1. For the above condition the hopper will be located

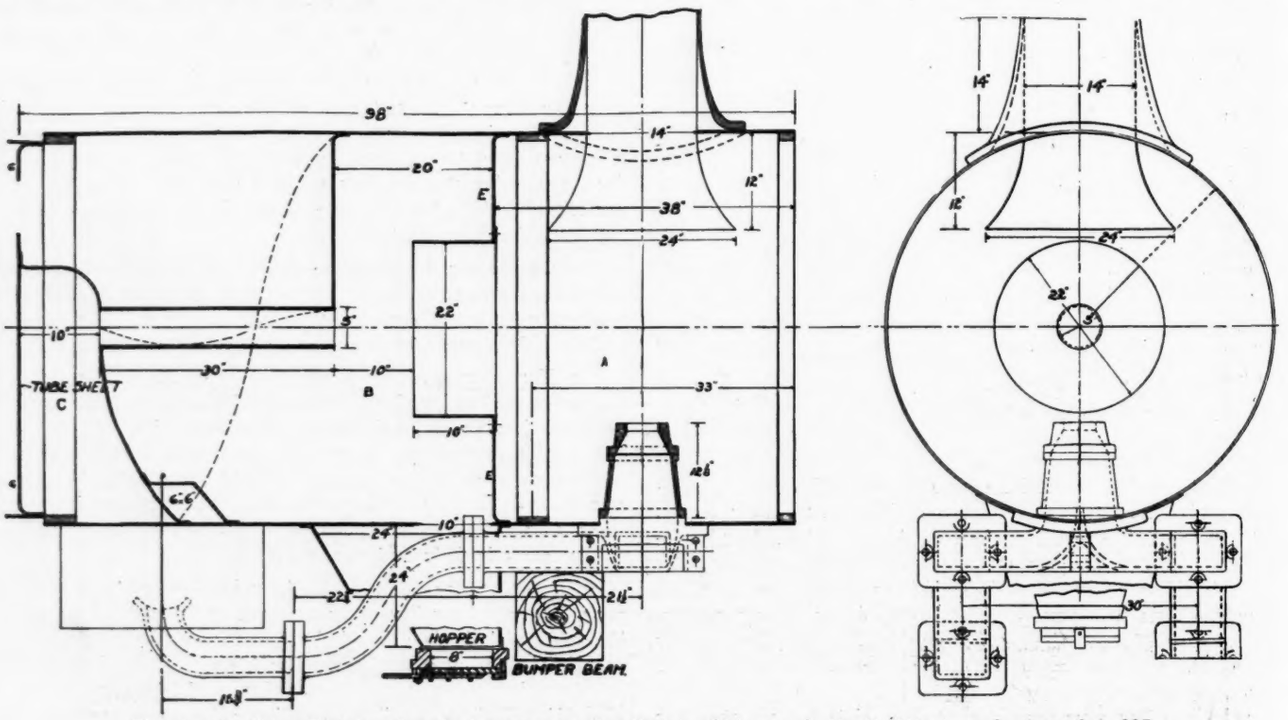


Fig. 3—VanHorn-Endsley Spark Arrester as Applied to Chicago & North Western Locomotive 395.

in front of the saddle, requiring a 24-in. extension of the former front end and a goose-neck form for the nozzle. This would be the condition in most cases of remodeling.

The tests were made on a Chicago & North Western locomotive

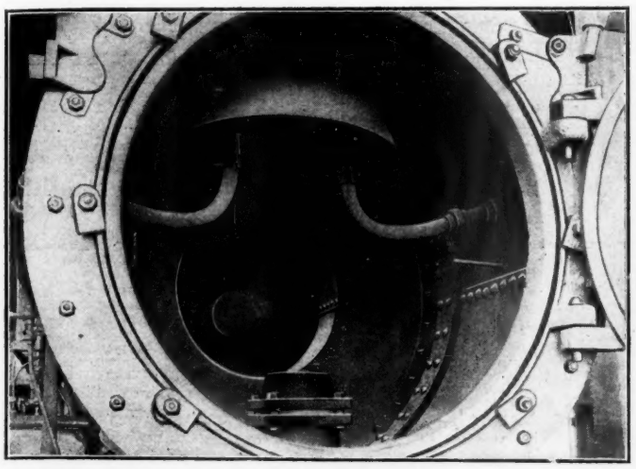


Fig. 4—Front View of the Smoke-box of Locomotive No. 395, Chicago & North Western.

of the American type, No. A395. The dimensions of the locomotive were as follows:

Weight on drivers	51,355 lb.
Total weight of locomotive	82,300 lb.
Number of tubes	140
Diameter of tubes	2 in.
Length of tubes	144 in.
Heating surface of tubes	800 sq. ft.
Heating surface of firebox	115.9 sq. ft.
Total heating surface	995.9 sq. ft.
Length of firebox	66 in.
Width of firebox	35.5 in.
Grate area	16.27 sq. ft.
Average diameter of drivers	59.9 in.
Diameter of cylinders	17 in.
Length of stroke	24 in.

The front end consists of what might be called three chambers. As shown in the drawing, Fig. 3, these are designated by the letters A, B and C. Chamber A takes up 38 in. of the front end. In its center is located the stack, which is made up of two parts, the ordinary cast iron outside stack being 4 ft. high, into which is riveted an inside stack which projects 12 in. into the smokebox, or chamber A. The bottom of this inside stack is bell-shaped and is 24 in. in diameter. The nozzle is located directly under the stack and the exhaust steam is carried from under the saddle by means of two passages as shown. The center line of the saddle is D D. In other words, the nozzle and stack were moved 61 in. forward of their ordinary positions and the opening to the exhaust nozzle base is capped by a plate, new

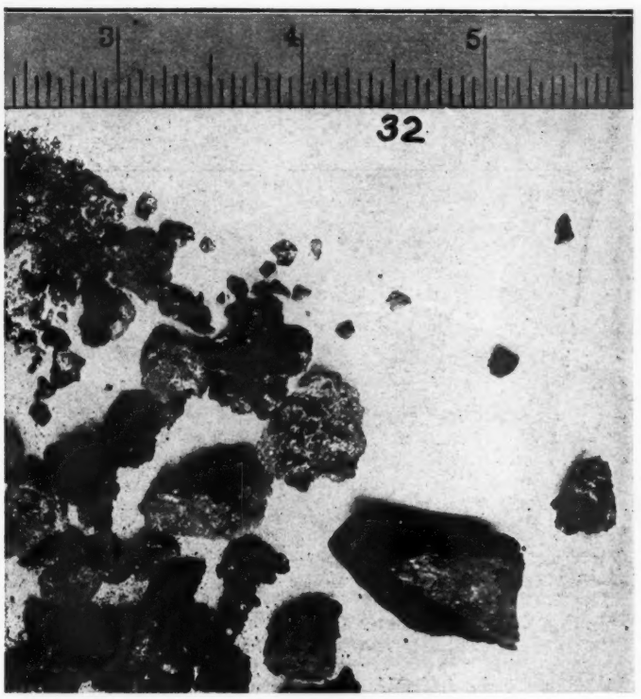


Fig. 5—Youghiogheny Coal. Cinders Caught in Hopper. Run No. 32.

openings being made into the exhaust passage under the saddle. From this point the steam was carried to the new position of the nozzle. The size of the nozzle tip was 4 1/16 in.

Separating chamber A from chamber B is a large circular plate E E in the center of which is an opening 22 in. in diameter, and

TABLE No. 1.

NUMBER OF TEST. I	DATE OF TEST. II	LENGTH OF TEST IN MINUTES. III	KIND OF COAL. IV	STEAM PRESSURE IN POUNDS PER SQUARE INCH. V	SPEED IN MILES PER HOUR. VI	DYNAMOMETER PULL IN POUNDS. VII	DYNAMOMETER HORSE-POWER. VIII	BACK PRESSURE IN POUNDS. IX	VACUUM IN FRONT OF SMOKE BOX IN INCHES OF WATER. X	VACUUM IN FRONT OF TUBE SHEET IN INCHES OF WATER. XI	COAL BURNED PER HOUR IN LBS. XII	WATER USED PER HOUR IN LBS. XIII	LBS. OF WATER PER LBS. OF COAL. XIV	CINDERS CAUGHT IN HOPPER IN LBS. PER HOUR. XV	SOOT & FINE CINDERS PASSING OUT STACK IN LBS. PER HR. XVI	TOTAL CINDERS PER HOUR. XVII	PERCENT OF COAL APPEARING AS CINDERS. XVIII	PERCENT OF CINDERS GOING OUT OF STACK. XIX	REMARKS. XX
1	7-19-10	30	[illegible]	140.0	16.12	3800	249	2.20	3.60	2.10	1304	12208	9.35	68.00	498	72.98	5.57	6.85	
2	7-19-10	30	[illegible]	134.0	17.35	5525	281	2.20	3.60	2.10	1084	10682	9.85	72.00	4.63	76.65	7.07	6.07	
3	7-19-10		[illegible]						10.00	5.70				150.0	8.18	158.18			NO COAL OR WATER WEIGHED.
4	7-19-10	15	[illegible]	117.0	24.00	3860	406	6.30	7.70	4.30	2244			378.0	7.42	385.40	17.10	1.92	WATER NOT WEIGHED.
5	7-20-10	30	[illegible]	117.4	17.35	5776	206	3.84	3.63	2.50	1904	3640	6.48	74.00	6.32	80.32	5.41	7.87	
6	7-20-10	30	[illegible]	130.0	17.35	5373	215	2.26	3.78	2.36	1284	10302	8.18	68.00	3.38	91.38	7.13	3.88	
7	7-20-10	60	[illegible]	124.6	17.35	5283	211	2.04	3.40	2.02	1024	9634	9.39	72.00	2.92	74.92	7.30	3.90	
8	7-20-10	60	LINTON	122.6	17.35	5196	208	2.00	3.36	1.90	2329	8712	3.74	96.00					[illegible]
9	7-20-10	6	LINTON	108.7										90.00	6.96	896.90		0.77	NO COAL OR WATER WEIGHED.
10	7-21-10	53	LINTON		27.70	3510	259	2.42	3.87	2.19	1873	8180	4.36	132.5	12.05	144.50	7.75	8.28	
11	7-21-10	55	LINTON	103.0	16.30	4244	184	1.44	2.97	1.84	1804	8675	4.64	114.1					[illegible]
12	7-21-10	30	LINTON	115.0	17.35	4784	191	1.88	3.41	2.18	1396	9578	6.85	124.0	18.58	138.58	9.93	9.06	
13	7-22-10	60	LINTON	124.0	17.35	5337	213	2.03	3.13	1.90	1345	8359	6.21	97.00	4.62	101.62	7.75	4.54	
14	7-22-10	3	LINTON											1520	4.58	1524.5		2.99	WATER OUT OF SIGHT GLASS.
15	7-22-10	40	LINTON	130.7	17.35	5320	212	2.10	3.59	2.02	1524	8760	5.74	109.5	3.04	118.54	12.15	7.63	
16	7-22-10	24	LINTON	127.4							1987			245.0	8.60	253.60	12.70	3.40	SUBURBAN RUN 2 HRS AND 37 MIN.
17	7-22-10	45	COKE	114.9	28.00	3035	226	3.80	5.07	3.54	1515	7020	4.64	62.50	3.24	65.74	4.44	4.33	
18	7-22-10		LINTON		27.70	3600	266												WATER & COAL NOT WEIGHED.
19	7-22-10		COKE																WATER & COAL NOT WEIGHED.
20	7-23-10	36	LIGNITE	127.0	17.35	4830	193	1.90	3.32	1.98	1860			195.0	13.45	208.45	11.20	6.44	WATER NOT WEIGHED.
21	7-23-10	4	LIGNITE	123.5	32.80	4400	381			6.55				2640.	178.0	3718.0		4.79	WATER & COAL NOT WEIGHED.
22	7-23-10	30	LIGNITE	110.6	17.35	3305	136	1.40	3.10	2.40	2289			210.0	8.08	218.00	9.52	3.69	WATER NOT WEIGHED.
23	7-23-10	8.5	LIGNITE	123.0	17.35	5010	209	1.88	3.30	1.90				240.0	12.75	252.80		5.04	WATER & COAL NOT WEIGHED.
24	7-25-10	20	LIGNITE	109.2	17.35	4490	179	1.64	2.88	1.90	1305			318.0	8.60	326.60	25.00	2.63	WATER NOT WEIGHED.
25	7-25-10	30	[illegible]	117.0	17.35	5348	214	2.10	3.63	2.30	1466	7484	5.10	92.00	13.88	105.80	7.20	12.80	
26	7-25-10	30	[illegible]	121.8	17.35	4808	192	1.86	3.50	2.20	1804	7962	5.28	88.00	3.44	91.44	6.01	3.77	
27	7-25-10	20	LIGNITE	114.0	17.35	4485	180	1.80	3.60	2.80	1779	7347	4.13	164.0	14.15	170.20	9.60	8.26	
28	7-25-10	15	LIGNITE	104.4	17.35	3825	183	1.42	3.17	2.43	1408			104.0	11.35	115.40	7.19	8.83	WATER NOT WEIGHED.
29	7-26-10		LIGNITE		19.10	4666	237												NIGHT RUN WATER & COAL NOT WEIGHED.
30	7-26-10	60	LIGNITE	101.2	17.35	3839	153	1.30	2.60	1.90	1065			81.00	3.55	84.55	7.95	4.19	WATER NOT WEIGHED.
31	7-26-10	60	LINTON	115.0	17.35	4645	186	1.75	3.37	2.30	1452	6289	4.36	76.00	12.90	88.90	6.12	14.52	
32	7-26-10	50	[illegible]	126.4	21.70	4188	242	2.59	5.60	3.53	1476	9834	6.66	81.70	6.83	88.53	6.01	7.71	
33	9-22-10	55	[illegible]	137.8	17.35	5664	262	2.30	3.75	2.77	1214	8657	7.13	95.60	14.24	109.80	9.05	12.90	
34	9-22-10		[illegible]																NIGHT RUN NO RECORDS TAKEN.
35	9-22-10		LIGNITE																NIGHT RUN NO RECORDS TAKEN.
36	9-23-10	40	LINTON	138.0	17.35	5782	267	2.13	3.93	2.67	1344	8676	6.45	117.0	10.85	127.20	9.47	8.06	
37	9-23-10	40	LINTON	137.6	17.35	5806	284	1.96	3.80	2.36	1845	8318	5.36	121.6	4.73	126.20	8.17	3.78	

OK 22.

projecting out from this opening into chamber B is a collar 10 in. long having the same diameter as the opening in plate E E. This opening is the only connection between chamber A and chamber B. At the bottom of chamber B is located a hopper which projects

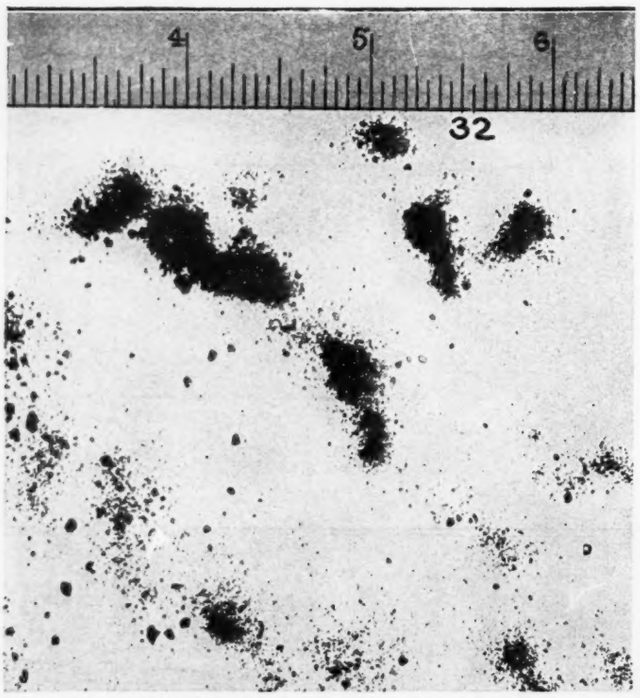


Fig. 6—Youghiogheny Coal Loss Through Stack. Run No. 32.

24 in. down from the smokebox and has a slide in the bottom for opening and cleaning out. At the back of chamber B is located a spiral diaphragm of one revolution which diaphragm separates chamber B from chamber C, chamber C being that part

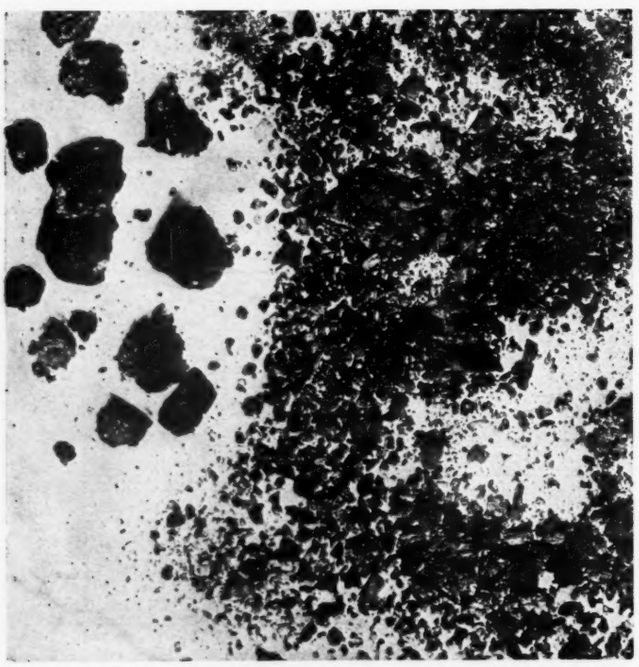


Fig. 7—Lignite (Wyoming) Coal Cinders Caught in Hopper. Run No. 30.

of the smokebox just in front of the tube sheet G. This diaphragm consists of a spiral plate, the periphery of which follows the inside wall of the smokebox and advances during one revolution an amount which is equal to 30 in. The inside edge of this spiral diaphragm follows the outside wall of a 5-in. tube in the center of the smokebox and advances the same amount as the outside edge of the spiral diaphragm. In the lowest part of the spiral is located an opening 6 x 6 in.

The claim made for this form of front end is that the gases coming through the tube sheet are diverted by means of the spiral diaphragm from chamber C into chamber B and are given a rotary motion around the outside wall of the smokebox, which motion throws all heavy particles such as cinders to the outside wall and carries them forward over the hopper, in which they are deposited. The gases are carried out through the opening in the collar into chamber A and from there out of the stack. The claim is also made that this form of front-end does not interfere with the steaming of the locomotive. Fig. 4 is a view looking in the front end. The collar and the end of the spiral diaphragm may be plainly seen.

TESTS.

Method of Testing.—After the locomotive had been mounted on the testing plant, and all adjustments made, tests were run at different speeds, the following observations being made: Speed, drawbar pull, steam pressure, vacuum in chamber A or in the front part of the smokebox, vacuum in chamber C or just in

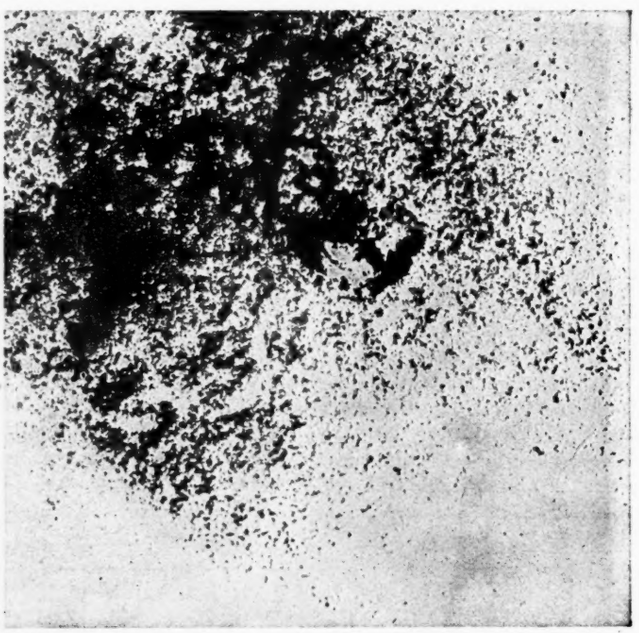


Fig. 8—Lignite (Wyoming) Coal Loss Through Stack. Run No. 30.

front of the tube sheet, exhaust steam pressure, referred to as back pressure; weight of cinders collected in the hopper, and approximate weight of cinders going out of the stack. The speed was obtained by means of a Boyer speed recorder, the drawbar pull was read from the Emery dynamometer, the vacuum in chamber A and chamber C was read in inches of water in an ordinary open manometer and the exhaust steam pressure was read by a mercury pressure gage. This gage is the one used in all stack work at Purdue University and reported to the Master Mechanics' Association in 1905. A full description of it will be found in the proceedings of the Master Mechanics' Association in 1906. It is accurate to one-twentieth of a pound. Cinders collected in the hopper were weighed after each run. The weight of soot and cinders passing out of the stack was obtained by a sampling tube above the stack. By means of a suitable curved tube, it is possible to explore the exhaust from the stack and to entrap all solid matter which comes within the area covered by the end of the exploring tube. From data thus secured, the approximate amount of soot and cinders can be obtained.

Discussion of Tests.—Some 37 different tests were run, 13 with Linton coal, 12 with Youghiogheny coal, 10 with lignite coal

and 2 with gas coke. The tests varied in length from short heavy runs to 60 minutes. No record of water or coal was kept for tests under 20 minutes, as it was felt that it would not be of any great value. Besides the record runs reported, the locomotive was run three nights for a short time under full steam. These night runs were for the purpose of determining more completely the amount of cinders, if any, passing out of the stack. The first evening run was conducted on Linton coal and gas coke, the second evening lignite coal was used and the third evening Youghiogheny and lignite coals were used. During the twenty minutes' run with coke, only three visible sparks were seen passing ont of the stack, and during a similar run with Indiana coal, only 12 visible sparks were seen passing out of the stack, these being extinguished before reaching the ground.

During the second evening, when burning lignite coal, while getting up speed and running under a heavy load, very few sparks were seen to pass out of the stack, not more than an average of one for each eight or ten seconds. The only time that any considerable number of sparks were seen was just after shutting off steam, when a number of very small sparks, known as "floaters" in the lignite district, were seen to pass out of the stack. All of the sparks during the evening's run, with the exception of two or three while using lignite coal, were out before they reached the ground. During the runs made on the third night, using Youghiogheny coal, and a twenty-minute run of a suburban nature, four visible sparks were seen to pass out of the stack, but during the same length run with lignite coal a considerable number of floaters were ejected just after the steam was shut off.

The results obtained are shown in the accompanying table. It will be seen from the dates of the runs that thirty-two of them were made in July of this year, from the 19th. to the 26th. The last five were made in September of this year. The runs made in July were not satisfactory from the standpoint of the steaming of the locomotive, due partly to leaks which appeared in the boiler, but runs Nos. 33, 36 and 37, which were made in September of this year, showed good results from the steaming standpoint. The safety valves were set at 139, and it will be seen that these three runs gave an average steam pressure above 137 pounds. The length of the tests in most cases was less than an hour. This was necessitated by the fact that the hopper, as constructed upon this locomotive, was of such capacity as to require emptying at frequent intervals, not allowing a test over sixty minutes in length. Most of the runs were made at a speed of about 17 miles per hour. This was made necessary from the fact that the locomotive was balanced for the road, and when placed upon the testing plant it was out of balance horizontally to such an extent that it was impossible to read the dynamometer at speeds over 30 miles an hour. At speeds as great as 25 miles an hour the vibration of the dynamometer was quite noticeable. Some inconsistencies may be detected in the weights of coal and water recorded. The inconsistency in the weight of coal is due, no doubt, to the shortness of the runs, while the inconsistency in the weights of water used is probably due to the leaky condition of the boiler, as during the entire running some large flue and mud-ring leaks were present.

It will be seen from column XV, table No. 1, that the weight of cinders in the hopper per hour varied from 62.5 pounds at run No. 17 with coke, to 2,640 lbs. at run No. 21 with lignite coal. The latter run was only four minutes long, and was of such a severe nature as to draw the water out of a manometer in the smokebox, which made the vacuum greater than 14 in. This run was made by placing the reverse lever down in the corner, and opening the throttle wide at a speed of 32.5 miles per hour. This was the most severe run of all. The average for most of the heavy runs below this was about 350 lbs. per hour, and of the entire number of runs made, fifteen of them were less than 100 lbs. per hour. The soot and fine cinders going out of the stack per hour varied from 2.92 lbs. at runs No. 7 to 178 lbs. per hour at run No. 21 using lignite coal. The per cent. of coal appearing as cinders, as given in column XVIII, shows that the per cent. varies from 4.44 at run No. 17 while burning coke to 25 per cent. at run No. 24 while burning lignite coal. The average for most of the runs would be less than 9 per cent. The per cent. of cinders going out of the stack as given in column XIX varied from .77 of one per cent. at run No. 9 using Linton coal to 14.52 per cent. at run No. 31 using the same coal. Of the twenty-nine tests where this record is obtained, nineteen of them show less than 8 per cent. of the cinders going out of the stack. The sizes of the cinders caught in the hopper and those going out of the stack are well shown by Figs. 5 to 8. Fig. 5 is a partial view of the cinders collected in the hoppers while burning Youghiogheny coal during run No. 32; Fig. 6 of the cinders collected from the stack during this run while using the same coal; Fig. 7 the cinders collected in the hopper while burning lignite coal during run No. 30; and Fig. 8 the cinders collected from the stack during this run while burning the same coal. It will be seen from these photographs that cinders which pass out of the stack are very small in proportion to those that are caught in the hopper. These tests were made under the direction of Louis E. Endsley, associate professor of railway mechanical engineering, Purdue University, Lafayette, Ind.

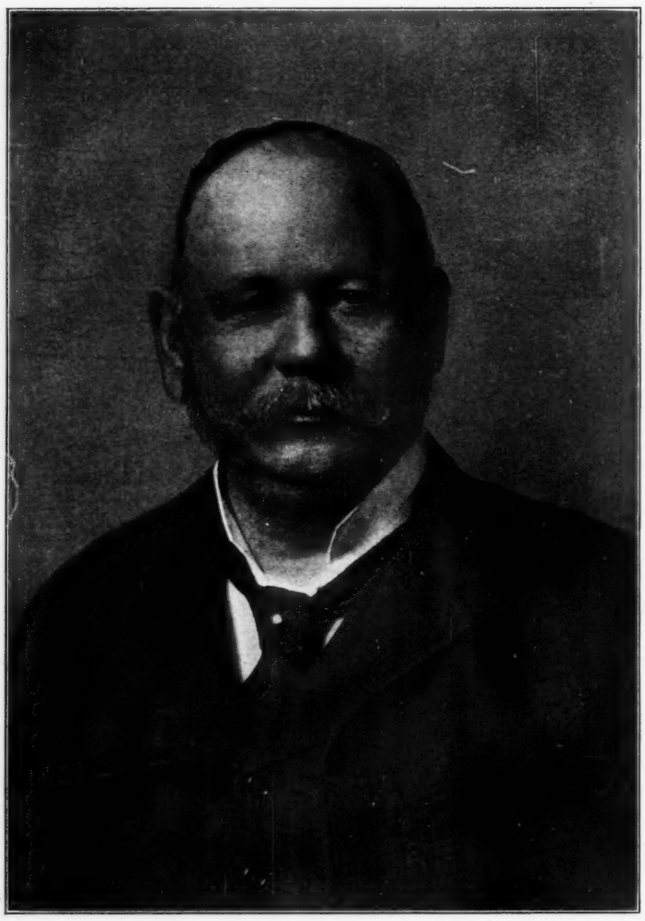
Conclusions: Locomotive No. 395 was returned to Chicago and used satisfactorily on a short suburban run and then sent to Clinton, Iowa, where it is being used on a three-mile run to Fulton, Ill. It gave satisfaction on longer runs, but the hopper capacity is limited to thirty-mile runs. It steams freely with the device. Disposal of the cinders is a problem to be worked out. The quantity is greater than ever collected before. The hopper must be air-tight and the outlet must be sealed to prevent killing the draft. A solution of the problem has been offered and approved for trial on the first locomotive equipped, and there is no question of solving the problem as satisfactorily as has been done with the collection of the cinders. To the railways the cinder problem is serious and its solution will be recognized. The railway demand today is for more power. The greater the power, the greater the consumption of coal, resulting in a greater production of cinders, making more serious the problem. Fire losses attributed to these cinders are in the aggregate enormous. They include buildings and bridges of the railways, and business property on or near the right-of-way, with serious loss to the railway, to its patrons and to conservation of property and natural resources. Fire insurance companies make an extra charge to insure property on the railway right-of-way, and the railways recognize the danger by requiring a release, on leased sites, from the fire losses caused by locomotives. At no time has the spark loss been recognized as today, and at no time has the problem been more serious in demanding a solution. The Van Horn-Endsley spark arrester is being handled by the American Spark Arrester Company, Indianapolis, Ind.

Nearly 1,500 miles of the Cape to Cairo Railway have been completed from Cairo southward, and nearly 2,500 miles from Cape Town northward. The terminus of the northern section, lately at Senaar, 160 miles southeast of Khartoum, is now at El Obeid, the capital of Kordofan. The end of the southern section, lately at Broken Hill, is now at the frontier of Independent Congo, 400 miles north of Broken Hill. The wealth of the 30,000,000 Congo State natives influenced the managers to change their original plan and steer straight for that territory. The railway line which runs from the mouth of the Congo river, on the Atlantic coast, to Stanley Pool, and which will soon be extended eastward, was another attraction. From the Congo frontier at Kassanshi the line will be continued 120 miles northward to Katanga by the French Katanga Railway. Again, from Kassanshi the Cape to Cairo main line will run northwestwardly another 400 miles to Lake Tanganyika. The unfinished portion of the line from the southern end of Tanganyika to Bahr-el-Ghazal is about 2,000 miles. This section of the line will be built much more rapidly than the two extremities, because materials for construction will be brought in by the lateral railways.

JAMES T. HARAHAN.

James T. Harahan has resigned from the presidency of the Illinois Central, effective January 12, and Charles H. Markham, formerly vice-president and general manager of the Southern Pacific, has been elected to succeed him.

Mr. Harahan came to the Illinois Central as second vice-president 20 years ago. He had an excellent record already as a railway operating officer, but the work which was to give him high rank among railway operating men was yet to be done. This consisted of making and carrying out plans for handling the enormous World's Fair traffic of the Illinois Central between the up-town district of Chicago and the exposition grounds at Jackson Park. The way the crowds were handled greatly enhanced the reputation of the road and of its second vice-president. This really marked the beginning of Mr. Harahan's career on the Illinois Central.



James T. Harahan.

Stuyvesant Fish, while president of the road, had his office in New York, and Mr. Harahan, whose jurisdiction included both the traffic and the operating departments, was the real executive of the road from 1890 to 1906. During this period the Illinois Central increased its mileage from 2,799 miles to 4,374 miles, not counting the Yazoo & Mississippi Valley, with its 1,210 miles. The property was well operated, its handling of its large suburban business in Chicago being especially excellent.

In 1906 came the famous struggle between E. H. Harriman and Stuyvesant Fish for control of the Illinois Central. Mr. Fish had brought Mr. Harahan to the road, and when the latter cast his vote as a director to oust the former president, he was denounced by Mr. Fish as ungrateful. Mr. Harahan himself was elected president to succeed Mr. Fish.

The most important event connected with the development of the property during Mr. Harahan's administration was the acquisition of control of the Central of Georgia in 1908, the deal being put through by Mr. Harriman. Mr. Harahan's administration of the property has been along conservative lines. It has continued to be well operated, and its stock has continued to be an attractive investment. One exception must be made to the statement that it has been well operated. During this year the discovery was made that the highest officers in the operating department had been for a long time practicing frauds on the road by paying excessive amounts for the repair of cars and dividing the proceeds with the car repair concerns to which the excessive payments were made. Mr. Harahan himself started the investigation which resulted in the detection of the frauds, and evidence brought out in the criminal trials of the former officers showed that he had suspected the existence of the conditions, and had directed the former vice-president of the road to make an investigation, which had been sidetracked. However disagreeable it may be to Mr. Harahan to have his administration of the property end at a time when the parties accused of these frauds are on trial, it is, no doubt, a satisfaction to him to know that the record shows that if he at all failed in his duty it was merely in trusting too implicitly to the honesty of subordinates who, as a matter of fact, stood extremely high in the railway world.

Mr. Harahan was born in 1843 at Lowell, Mass. He began railway work in 1864 with the Orange & Alexandria in Virginia, and was then, consecutively, with the Nashville & Decatur at Nashville, Tenn.; the Louisville & Nashville and the Shelby Railroad. For seven years from 1872 he was roadmaster of the Nashville & Decatur, going with the Louisville & Nashville in 1879, first as superintendent of the Memphis division, and then of the New Orleans division. He was made general superintendent in 1883 and general manager in 1884. In January, 1885, he was made general superintendent of the Pittsburgh division of the Baltimore & Ohio returning to the Louisville & Nashville as assistant general manager in April of the same year. He held that position until 1888, when he went to the Lake Shore & Michigan Southern as assistant general manager. He was later appointed general manager of the Chesapeake & Ohio, and afterwards held the same office on the Louisville, New Orleans & Texas. He was elected second vice-president of the Illinois Central in November, 1890, and in November, 1906, he was elected president of that road, the Indianapolis Southern and the Omaha Bridge & Terminal Railway.

Mr. Harahan has been thorough and persistent in his study of the art of railroading. He has always read all the current literature he could get hold of. While still a division superintendent he set out to learn the work of the traffic department. He did this by reading and by following it up on the road. He never got so immersed in the operation of the division as to lose sight of the fact that the object of the road was to carry out contracts made by the traffic department, and that efficiency in operation meant doing this quickly and cheaply. In other words, he worked in harmony with the traffic people and did not let himself be carried away by enthusiasm for running trains in such a way as to save coal but lose freight.

He spends a lot of time on the road. The Illinois Central's geographical position is peculiar in that it cuts across so many east and west routes, by whose through rates they must be governed. This makes its traffic arrangements complicated, and these conditions and meeting the wants of its local shippers are things with which Mr. Harahan keeps in close touch. Similarly, he goes out to the Pacific coast often to drop in on his agencies there. These things do not mean that he is in danger of getting swamped with detail. Such inspections are more in the nature of surprise tests. As a matter of fact, he has a nice judgment as to the point beyond which the details of work should be handled by subordinates. He goes into many details because of his progressive attitude which demands that he do not adopt a method

simply because it has been successful on another road or on the same road by a predecessor; he wants the proposition proved over again with regard to local present day conditions so as to make sure that it is still the best.

He cannot keep his finger on such details and at the same time keep up his work as railway president, which requires broad vision and a grasp of situations in the large, without putting all his time and energy to it; so he does no outside work. He holds office only in companies subsidiary to the Illinois Central, except that he is a director in one bank. Whether at his office or not, he lives in the Illinois Central atmosphere and works for it.

TRANSPORTATION AND CAR ACCOUNTING OFFICERS.

The fourteenth semi-annual meeting of the Association of Transportation and Car Accounting Officers was held at Chicago, December 13 and 14, with 118 members present, and M. B. Casey, President, in the chair. W. L. Park, Vice-President and General Manager of the Illinois Central, addresesd the Association briefly, and in connection with his address the members were urged to take under consideration the advisability of presenting a recommendation covering a continuous home route card, to accompany car. Such a card would make available at all times all necessary information to permit of the proper return of the car.

Resolutions were adopted in connection with the deaths of S. C. Annable, of Pomona, Cal., and Ashley J. Elliott, manager of the Illinois and Iowa Demurrage Bureau. Announcement was made of the appointment of John E. Harley as assistant secretary.

The Association concurred in the report of the Committee on Car Service recommending that no action be taken in connection with the method proposed at the Colorado Springs meeting of penalizing roads for refusal to comply with owner's demands for the return of equipment which has been away from the home road for a specified period, believing that a strict observance of Rules 1 to 4, Code of Car Service Rules, of the American Railway Association, would accomplish the desired result. The recommendation of the Committee with regard to the formation of a car pool for the handling of automobile box cars was adopted for submission to the American Railway Association; but, it was also decided to recommend the inclusion of furniture cars, as well as automobile cars, in such a pool. The Committee reported designating letters assigned by the Master Car Builders' Association to indicate the different kinds of cars and recommend that the symbols provided be inserted in all equipment lists, opposite each particular series of numbers to which each particular symbol applies. The recommendation was adopted. A supplementary report was presented by the Committee and adopted by the Association, submitting to the American Railway Association the recommendation that Rule 6, Code of Switching Reclaim Rules, be eliminated, and that new Rule 18, Code of Per Diem Rules, be substituted therefore, with the addition that a footnote reference be added to proposed Rule 6 as follows: "Two or more roads in local territory may agree to disregard Rule 14 as applicable to cars in switching service, but such agreement shall not be binding upon a dissenting minority."

The Committee on Office Methods and Accounting made a report of progress in connection with the subject of assignment of reporting marks to cars of railway and private ownership. The Association adopted its recommendation that where practicable the typewriter be used in the preparation of junction reports. The Association concurred in its recommendation that it is unnecessary to provide a separate form for use by the reporting road in making corrections to junction cards previously rendered by it, believing that such corrections may be satisfactorily made on the prescribed form "D". Under Subject No. O. M. 14, respecting methods for reducing claims for unreported Per Diem, the Association adopted the committee's recommendation for submission to the American Railway Association, as an amendment to Per Diem Rule No. 1, as follows: "Where per diem is not reported to car owner within four months from the last day of the month in which it is earned, the rate shall be increased five cents per car per day for each four months or fraction thereof that report of such per diem is thereafter withheld, provided that the increase in the rate shall not exceed thirty-five cents per car per day. and provided, further, that it shall not apply to reclaims under Rules 5, 14 and 15." The Association adopted the recommendation of the committee for submission to the American Railway Association that prescribed form "D" (junction report) be printed on a good quality of bond paper of a basis of sixteen pounds to the ream of five hundred sheets of the size 17 in. x 22 in., and that the skeleton address be omitted from the reverse side.

The report of the Committee on Handling Railroad Business Mail was adopted. The Committee advised that the American Railway Association had adopted the circular covering the handling of railroad business mail, which was submitted to it by this Association at its last meeting.

The Association adopted the recommendation of the Committee on Conducting Freight Transportation that the Transportation Department immediately investigate all cases of over, short and damage freight as they develop, preliminary to their settlement by the regular claim department, and that it also maintain an efficient oversight to prevent the placing in service of defective cars, and that a sufficient force be provided to obtain proper seal records.

Report of the Committee was adopted recommending to the American Railway Association that it take under consideration the question of the application to each car of a device that will enable roads to have cars re-weighed and re-stencilled more expeditiously, such device to conform to M. C. B. Standards with reference to opening in holder and letters and numerals used therein. It is recommended that this apply only to cars of railway ownership.

A report of progress was offered in connection with the subject of rules for the handling of perishable freight.

The Association adopted the report of the Committee for submission to the American Railway Association, recommending that the latter body take under consideration the question of recommending to the Master Car Builders' Association a standard location for hasps on the doors of enclosed cars approximately sixty inches above the rail, in order to facilitate the rapid and correct reading of seals.

The recommendation of the Committee on Conducting Passenger Transportation with regard to proposed change in Rule 7, Code of Car Service Rules, was adopted for submission to the American Railway Association. The rule as proposed recommends that rates on passenger train cars, when used in joint service and when loaned on a per diem basis, be made according to seating capacity and length of car. The Association adopted the recommendation of the Committee, for submission to the American Railway Association, with reference to proposed change in Rule 8, Code of Car Service Rules, so that when it is necessary to haul cars empty over roads owning them, or intermediate roads, for delivery to borrowing roads, mileage shall be applied for hauling the cars from the point where they left service to the point of connection with the borrowing roads and return to a point satisfactory to the loaning road. It was also decided to request the American Railway Association to take such action as will establish tariff rates of not less than ten cents a mile for the hauling of passenger train cars.

A report of progress was received from the Committee on Joint Interchange and Inspection Bureaus, indicating an encouraging condition of the experiment in effect at the Union Stock Yards, Chicago.

At the close of 1909 there were in operation in Argentina 15,849 miles of railway, an increase of 1,098 miles over 1908. The number of passengers carried totaled 50,810,000, and the freight carried amounted to 31,955,000 tons.

JOHN M. FORBES AND THE MICHIGAN CENTRAL.*

BY HENRY G. PEARSON.

II.

THE RACE TO CHICAGO.

The older railways in the East yielded every six months a wreckage of embarrassments and disasters, all of them being due to the mental or moral incompetence of the men who undertook to guide them through the uncharted waters of railway finance. To find and to keep the channel under such circumstances required a remarkable measure of alertness, faith, and courage. Railroading is pre-eminently an enterprise in which men must think in terms of decades and scores of years; yet at this time the oldest road in Massachusetts had been running barely fifteen years. So it was that, in these hobble-de-hoy days, the Michigan Central owed no little of its brilliant success to the fact that its financial affairs were guided by a man so sound and resolute as John M. Forbes.

In the first three years of Forbes' presidency more than $6,000,000 was required for the purchase, construction, and equipment of the road. It was his business to secure this money, and the limits within which he could work were narrow enough. With Baring Brothers and with bankers in Europe, it is true, he was in close touch through his ventures in the China trade, and to such men he was constantly expressing the hope that the high rates of interest prevailing in the United States might prove more tempting than the 3 or 4 per cent. that they could get at home. The continuing decline of the China trade and the whaling industries in New England was an opportunity which Forbes made the most of. By his persistent and persuasive application to his friends, and by the action of the directors in applying to construction the 8 per cent. dividend of $176,000 earned in 1848, and issuing a dividend of stock, the cash needed to complete the road was raised. Thus, thanks to the faith and works of Brooks and Forbes, when, in the spring of 1849, the line was opened from lake to lake, the stockholders had every reason to be satisfied with their investment. Within a year, however, these illusions of security were dispelled. A group of New York capitalists bought the Michigan Southern, a struggling zigzag bit of line, once the property of the state, snapped up its Indiana charter, which the Michigan Central had rejected, and prepared to build a cheap railway from Toledo to Chicago. At the same time it became apparent to the most conservative minds that the construction of a railway along the southern shore of Lake Erie was only a few years distant. If the Michigan Central were not to become an isolated piece of road, picking up what business it could between its two lake terminals, it must extend its influence both east and west. Its owners must, in fact, double their investment if they were to save what they had already put in. To build in Indiana, the Michigan Central put money into the New Albany & Salem, a local affair which had 35 miles of track in the southern part of the state and a charter conveniently vague and which in return for the grateful inflow of Eastern capital consented to begin building at once a "branch" around Lake Michigan, in the northwestern corner of the state. The "Southrons" [Michigan Southern people] protested, and persistently sought injunctions; the Michigan Central men, to prove their good faith, had to put their hands deeper into their pockets, with the result that the New Albany & Salem achieved the glory of becoming the first line to connect Lake Michigan and the Ohio river.

In building the 20 miles of track in Illinois between the state line and Chicago even greater difficulties were in the way. Partly from proper reasons of economy, but chiefly because it had no charter, and the legislature would not meet for a year and a half, the Michigan Central desired to build and use a track in common with the Illinois Central's Chicago branch; and a secret agreement was made between the two companies by which the Illinois road was to deflect its track some half a dozen miles to the east, touching the Indiana boundary at the point where the Michigan Central stopped. In return for this favor the Illinois Central, as yet barely organized, acquired the universal desideratum, Eastern capital, and could begin to build at once.

At the mere suspicion of such plans, Chicago burst into wrath. Hitherto its isolation had greatly retarded its growth. Access to it by water from the East was by a long and roundabout route; from the land, being islanded in wet prairie and Illinois mud, it was practically inaccessible. Only a few years earlier the long delayed Illinois and Michigan Canal had been opened. Thus in 1850, though it had increased by 10,000 in the preceding decade, its population was still under 30,000, a pitiable showing when compared with the great river cities of Cincinnati, with 115,000, and St. Louis, with 78,000. Through railways it hoped for salvation; and yet even here there was danger. Lying 15 miles to the north of the southern end of Lake Michigan, it had fears lest the main line of traffic to the West and Southwest might pass it by altogether; and it shuddered at the prospect of becoming a mere way-station, and on a branch at that. Therefore, when in the spring of 1851 three railway companies were making plans for coming into Chicago, the city assumed an attitude of aggressive sensitiveness—perhaps not unknown since—and sought to dictate terms. Newspapers, city officials, and business men insisted that no through passengers or freight should be transferred at any junction-point outside the city, but that all should be brought within its gates for tribute. Furthermore, the hackdrivers and teamsters, fearing that their prospective trade might be nothing but a Tantalus glimpse, raised a cry that each railway must enter the city on its own tracks and have its own stations. These matters all came to a head in July, 1851, when two "railway conventions" were held at Chicago, at which the plans of the roads for reaching the city were made known to the public. The commotion, it is true, never reached the intensity of the "Erie War," that famous contest for a break in gage in order that the piemen of Erie, Pa., might sell their wares to passengers changing cars; but it is amusingly characteristic of this period in railway building. Indeed, for a season the luster of even great Judge Douglas was dimmed in Chicago by reason of his attitude on the railway question.

The Michigan Southern smoothed its way diplomatically. Having secured the charter of a plank road company which was alleged to have railway privileges, it proposed to come into the city on its own track, thus making sure of a gracious reception by the Chicagoans and of a generous subscription from them to its stock. The Illinois Central and the Michigan Central, for proposing to come together, were looked upon with disfavor. The directors of the Illinois road accordingly did not dare to carry out their agreemeent to swing their track eastward to the Indiana line, and there connect with the Michigan road. The nearest that they would consent to come left a gap of six and a half miles, over which Brooks and Joy proposed to build without a charter, trusting to the next legislature to legalize their action. Forbes protested. "Going without a charter a quarter-section is as bad as the Atlantic would be." Unused prairie though the land was, he argued, their enemies would be sure to build a highway across their proposed line to block them. Nevertheless, as the months went on this unsatisfactory scheme proved to be the only basis on which it was possible to go ahead.

Meanwhile, in Indiana, each line was racing to get its road completed first. The Michigan Southern men had the advantage of a good start, and were not retarded by scruples as to building solidly, but the seasons in their courses fought against them. The rails for the last section of their track reached Dunkirk, on Lake Erie, after the lake was closed to navigation, and, as luck would have it, in the following spring the lake was not clear until

* From a forthcoming biography of John M. Forbes, who, at his death in 1898, was chairman of the board of directors of the Chicago, Burlington & Quincy. His service with that company and with the Michigan Central made him a prominent railway man for fifty years. A previous article appeared in our issue of December 2, page 1039.

a month later than usual. So, although the Chicago end of the line was completed in Indiana, passengers and freight must be transported a distance of 13 miles over a plank road. The Michigan Central, on the other hand, having ordered its rails in good season from England, built steadily, and achieved the triumph of beginning its regular through service on May 21, 1852, a day ahead of the first through train on the Michigan Southern, and a week before that road was in regular running order. A month later, at a special session of the Illinois legislature, the six-mile bit of track in Illinois was legalized.

The increase in gross earnings in 1855 over 1854 was 40 per cent., and the limit of its capacity as a single-track road was fast being reached. Moreover, the increase of traffic from the new roads in Illinois which were in alliance with the Michigan Central was only just beginning to be felt.

In this period of feverish expansion and fierce competition the management of the railroad had remained unchanged. The burden of responsibility borne by Brooks and Forbes had, of course, increased enormously, and their long toil was filled with diverse activities and charged in the highest degree with excitement. It was not within the power of either man to hold himself to the strict letter of his proper duties. Thus Forbes busied himself with a comprehensive scheme of railroads for the State of Illinois, and even of lines beyond the Mississippi, at a time when there were not a hundred miles of track west of Chicago; thus he took hold of the company which, with Brooks as constructor, built the "Soo" canal. No detail escaped him, either. The thousand and one possibilities which his nimble imagination was continually starting up his relentless habit of action drove him to carry into execution. Having noted the character of the land in southwestern Michigan, he tried to have the cultivation of sugar beets begun there; he sent fir and spruce trees to be planted on the station grounds of the railroad; he suggested improvements in passenger cars; he threw himself with ardor into the details of construction and equipment of the company's boats on Lake Erie.

And with all these affairs on his hands he was supposed to have enough time to hear the complaints of dissatisfied patrons. "One of our large stockholders," he wrote to a correspondent, "wants to bring a friend to let me know how badly we manage. A white-gloved, mustached youth is shown up, who is in the habit of going from Detroit, 20 miles west, and he *telths* me in a lithping *voith* I can't contheive of the ungentlemanly conduct of the conductorth—and often he could not get a theat, exthept alongthide of thome rough illdrethed fellow, and onth he had paid a dollar to a fellow to get up!

"Well! I tried to hire the young gentleman at double his *entire* value per annum to go everywhere and *abuse us,* as being the type of a considerable clan of complainants who want railroad companies to send along *twenty tons* of cars to carry the number of passengers that *ten* tons of cars are made to carry, and this without the *inevitable consequence* of such waste, viz., the charging the passenger with this additional cost of his transportation."

The conditions under which Forbes did his work would, to the business man of to-day, seem appalling. Not only was there no telephone, but even the telegraph was used sparingly. Furthermore, since Brooks and Joy were at Detroit, and two of the leading directors, Green and Corning, were in New York and Albany respectively, the discussion of every important matter had to be through correspondence, and almost all Forbes' letters were written with his own hand. At the end of a day in which he had filled 31 pages of his letter-press book, he wrote: "Y'rs in great haste, hunger, and all uncharitableness, having been here at my desk since 8½ a. m., now 6 p. m., living upon crackers! but still, Yours truly."

In 1855, having impaired his health by overwork, Forbes resigned the presidency of the Michigan Central. But the new board laid its plans too large, disregarded Forbes' advice, and, in the panic of 1857 got into a tight place; the Michigan Central, with many other railways, went to the wall. But Forbes, still interested in the property, was called upon, and he went to England for help. Thanks to his heroic efforts the Michigan Central was in a better position than even before. Writing on December 9, Forbes summoned up the story thus:

> The rival road has now made a combination with Michigan Central as an experiment which destroys competition, and, with a better chance than ever for reduced expenses, its future looks very well to those who are not depending on this year's dividends, which will go to clear off old scores. Its credit will *hardly* be touched, considering the power it has shown of recovering from the sudden flaw which capsized it, and many men think better of it than before because in the midst of the panic the company showed pluck and protected *old* bonds and new alike by its mortgage. Any road, they say, may get caught, but this one has not only shown capacity to pay but a sense of mercantile honesty to its bondholders and other creditors which begets more confidence than the *mere* capacity to pay.

With this signal act of courage and devotion to the interests of the road, for which from the begining he had been responsible, it may be said that the days of Forbes' railroad education were completed. As far as money went his profit had been small. The only direct return was a sum of $20,000 which the board of the Michigan Central had voted to him at the end of his term to replace his salary; the opportunity at the time of the crisis of purchasing stocks and bonds at a low figure he had been too hard pressed to take much advantage of; and when, a few years later, the great rise in Michigan Central came, he had sold the larger part of his holdings. But in railroad financiering he had received an invaluable training. He had taken the road through all the stages from "promotion" to bankruptcy, and had brought it out triumphant. The lesson had been burnt into his soul that the one thing rare in railroad management is also the one thing indispensable—an instinctive honesty which, acting promptly through a clear brain and a strong will, shall produce sound judgment and efficient action.

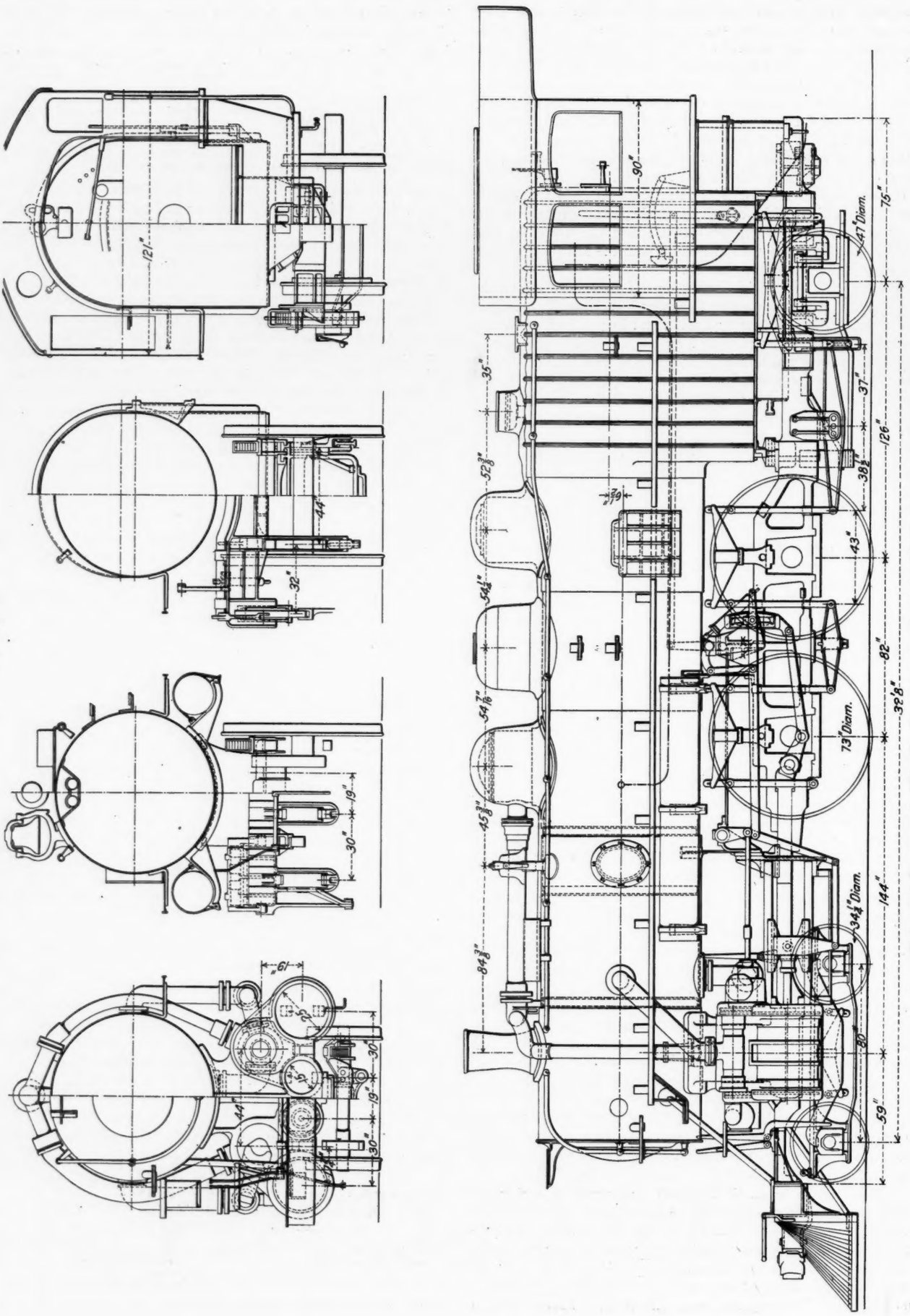
BALANCED COMPOUND ATLANTIC TYPE LOCOMOTIVES; ATCHISON, TOPEKA & SANTA FE.

Balanced compound Atlantic type locomotives have given splendid results in express passenger service on the Santa Fe. There are now 171 locomotives of this type in service on that road, including an order of 23 recently received from the Baldwin Locomotive Works. Several changes have been made in the design of this last lot of locomotives. The Atlantic type locomotives built in 1909 were fitted with both superheaters and reheaters. In the new engines a reheater only is used, and it is built into the shell as an integral part of the boiler. The fireboxes are of the Jacobs-Shupert type. As in the previous locomotives, the steam pressure is 220 pounds; with driving wheels 73 in. in diameter the tractive force is 23,800 pounds.

The inside and outside firebox shells are each composed of eleven channel sections. In order to provide ample steam room, the barrel ring immediately in front of the firebox is sloped on the top; the flattened sides of this ring are stayed by T irons. Two steam domes are provided, one being placed near the front tube sheet and the other on the gusset. The latter is of cast steel and is in one piece.

The Buck-Jacobs reheater is built into the boiler shell as an integral part of it, and is placed adjacent to the smokebox. The heater is 48 in. in length and has 417 tubes. Between it and the evaporating section of the boiler is a combustion chamber 30 in. in length. This arrangement reduces the length of the tubes to 14 ft. 6 in., but experience indicates that this will not reduce the efficiency. The arrangement of the reheater makes it possible to place all the steam piping on the outside of the boiler. The live steam supply is drawn from the rear dome and is conveyed to the forward one through two pipes, each 5 in. in diameter. The throttle valve is placed in the forward dome and communicates with an external dry pipe which is placed on the top center line of the boiler. The pipe terminates in a T head, from which external steam pipes extend to the steam chests.

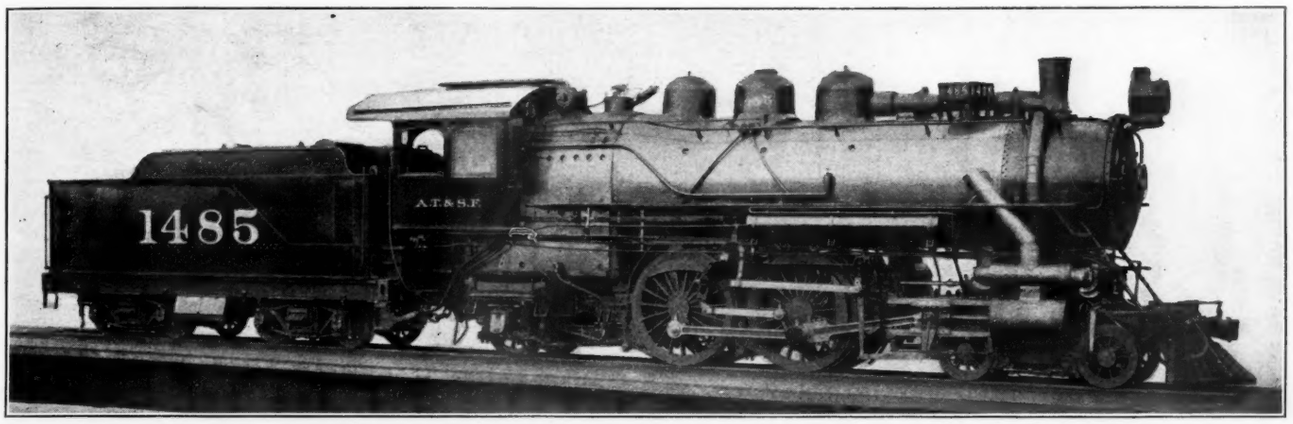
The steam distribution is controlled by one piston valve on each side as in the former locomotives. The steam chest heads are provided with internal extensions, which form steam tight sliding joints with the interior surface of the piston valve. The front steam chest head is closed, but the back head communicates with a pipe connection leading to the reheater. The high pres-



Balanced Compound Atlantic Type Locomotive; Atchison, Topeka & Santa Fe.

sure steam exhausts into the interior of the valve, and is then conveyed to the reheater by the pipe connection. Internal baffle plates here compel the steam to follow a circuitous course among the tubes. The steam leaves the reheater through right and left-hand pipe connections, and enters the steam chests through annular-shaped openings formed in the heads. The valves are arranged for outside admission to the low pressure cylinders; hence the low pressure ports are placed in the ends of the steam chests adjacent to the heads. The steam escapes under the outside sections of the valve and thence into the exhaust passages.

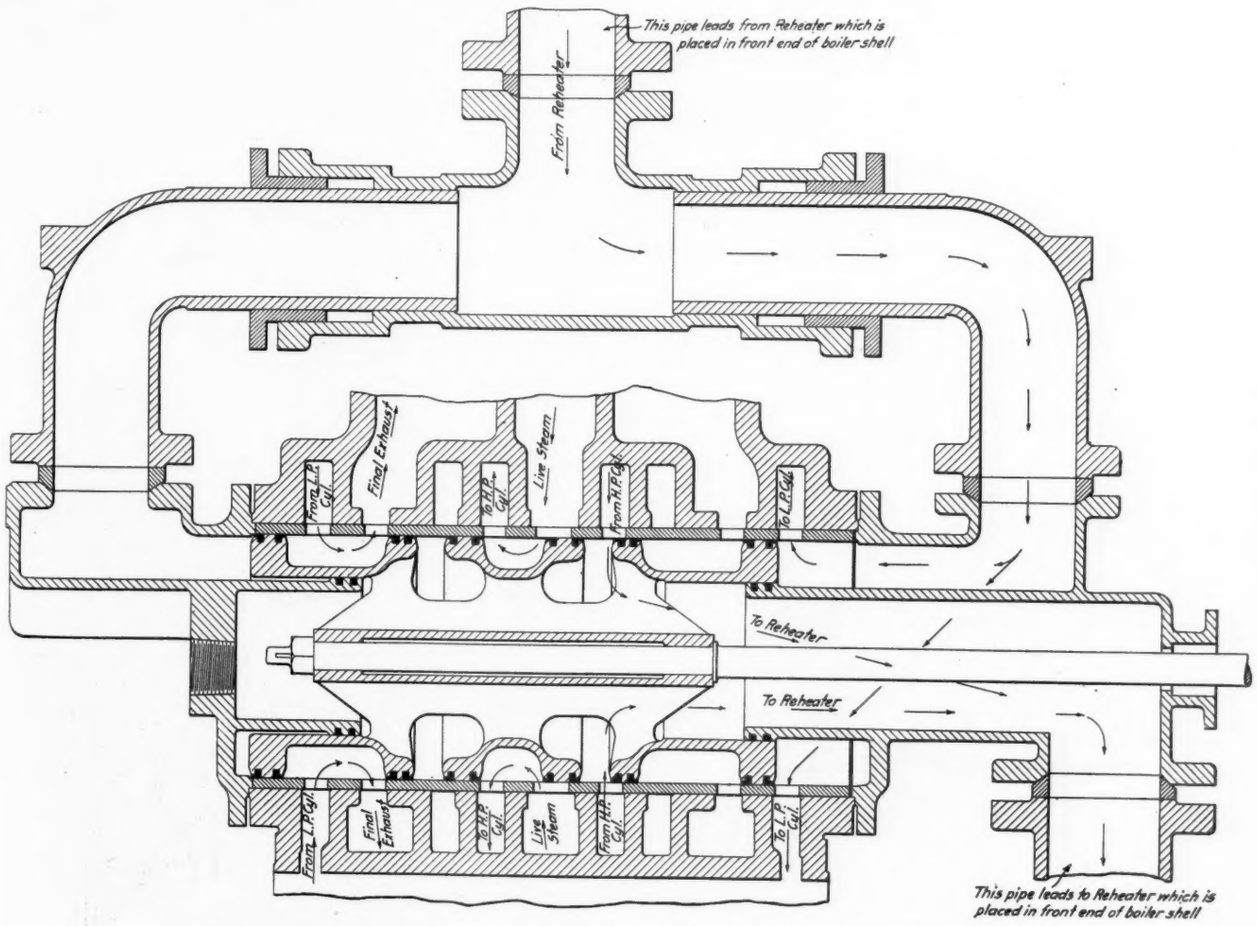
As in the previous Atlantic type locomotives all four main rods are connected to the first pair of driving wheels. The valve gear is of the Walschaert type and the links are placed back of the main drivers, in order to gain the necessary room. The valves are driven through rockers, whose bearings are bolted to the guide yoke. The frames have single front rails and separate rear sections. The trailing truck is of the Rushton type, with outside journals. The front truck has a swing bolster. The principal dimensions of these locomotives are as follows:



Atlantic Type Locomotive With Balanced Compound Cylinders; Atchison, Topeka & Santa Fe.

General Data.

Type	4-4-2
Service	Passenger
Fuel	Oil
Tractive effort	23,800 lb.
Weight in working order	231,675 lb.
" on drivers	112,125 lb.
" on front truck	62,225 lb.
" on trailing truck	57,325 lb.
" of engine and tender in working order	405,000 lb.



Section Through Steam Chest of Balanced Compound Atlantic Type Locomotive.

General Data.

Wheel base, driving	6 ft. 10 in.
" " total	32 ft. 8 in.
" " engine and tender	61 ft. 1 in.

Ratios.

Total weight ÷ tractive effort	9.7
Weight on drivers ÷ tractive effort	4.7
Tractive effort × diam. drivers ÷ boiler heating surface*	692.7
Total boiler heating surface* ÷ grate area	52.2
Firebox heating surface* ÷ total boiler heating surface, per cent.	7.5
Weight on drivers ÷ total boiler heating surface*	44.7
Total weight ÷ total boiler heating surface*	92.3
Volume equiv. cylinders, cu. ft.	8.30
Total boiler heating surface* ÷ vol. cylinders	302.00
Grate area ÷ vol. cylinders	5.70

*No allowance has been made for reheater surface.

Cylinders.

Kind	Bal. comp.
Diameter	15 and 25 in.
Stroke	26 in.

Valves.

Kind	Bal. piston

Wheels.

Driving, diameter over tire	73 in.
" thickness of tire	3½ in.
" journals, main, diam.	10 x 10½ in.
" " others, diam.	9 x 12 in.
Engine truck, diameter	34¼ in.
" " journals	6 x 10 in.
Trailing, diameter	47 in.
" journals	8 x 14 in.

Boiler.

Style	Wagon top
Working pressure	220 lb.
Outside diameter of first ring	72 in.
Firebox, width and length	63⅜ x 109⅝ in.
" plates, thickness	C. and S., 5/16; B., ⅜ T., 9/16 in.
" water space	F. and B., 5; S., 5½ in.
Tubes, number and diameter	273—2¼ in.
" length	14 ft. 6 in.
Heating surface, tubes	2,318 sq. ft.
" " firebox	190 sq. ft.
" " total	2,508 sq. ft.
Grate area	48 sq. ft.
Heating surface, superheater	1,147 sq. ft.

Tender.

Wheels, diameter	34¼ in.
Journals	5½ x 10 in.
Water capacity	9,000 gal.
Fuel capacity	3,300 gal.

TRAIN ACCIDENTS IN NOVEMBER.[1]

Following is a list of the most notable train accidents that occurred on the railways of the United States in the month of November, 1910. This record is intended to include usually only those accidents which result in fatal injury to a pasenger or an employee or which are of special interest to operating officers. It is based on accounts published in local daily newspapers, except in the case of accidents of such magnitude that it seems proper to write to the railway manager for details or for confirmation:

Collisions.

Date.	Road.	Place	Kind of Accident.	Kind of Train.	Kil'd.	Inj'd.
1.	N. Y. Central	Ossining	xc.	F. & F.	1	0
2.	Missouri, K. & T.	Honey Spg., Tex.	bc.	P. & F.	0	8
4.	Gulf, Col. & S. F.	Moody, Tex.	bc.	P. & F.	0	2
4.	Long Island	Jamaica, N. Y.	xc.	F. & F.	1	5
10.	Del. & Hud.	Whitehall	xc.	F. & F.	1	2
15.	Penn.	Sarg Hollow	rc.	P. & F.	0	0
17.	Penn.	Richmond, Ind.	xc.	P. & F.	1	2
28.	Balt. & Ohio	Altamont	xc.	P. & F.	4	3

Derailments.

Date.	Road.	Place.	Cause of derlmt.	Kind of train.	Kil'd.	Inj'd.
2.	Chi., M. & St. P.	Hosmer, S. D.	unx.	P.	2	0
2.	D., Lack. & W.	South Orange.	ms.	P.	0	1
19.	Penn.	Altoona.	boiler.	F.	3	3
19.	Penn.	Altoona.	acc. obst.	F.		

The derailment at San Hollow, Pa., on the fifteenth occurred about 1 a. m., and is notable from the fact that the passenger train involved was composed of steel cars and that these withstood the shock of the collision so well that no person was injured. An eastbound freight was moving through a crossover track and was struck in the side by a pasenger train, which consisted of two engines, one mail car and seven sleeping cars. Both engines of the passenger train were derailed and five cars of the freight train were wrecked. The passenger engineman had run past distant and home signals set against him, the distant signal being 4,700 ft. in the rear of the home signal. Snow was falling and there was considerable wind at the time, but the signals were visible. The reports say that the signals and the air brakes were all in good order.

The collision at Altamont, W. Va., on the twenty-eighth occurred at midnight. Westbound express train No. 7 ran into a helping engine which had just been detached from the front end of the express. Sleet was falling and the helper was delayed in entering the side track by reason of the switch being frozen. The accounts indicate that the engineman of the express train assumed that another engine, which he saw standing on the side track, was the one which had just been detached from his train. Both of the engines were knocked down a bank. A part of the train fouled the eastbound main track and train No. 96 on that track was derailed and badly damaged.

In the accident at Altoona, Pa., on the nineteenth one engineman and two firemen were killed and three other trainmen were injured. The second of two locomotives pushing a westbound freight train was wrecked by the explosion of its boiler and the boiler was thrown across the adjoining track immediately in front of another train moving in the same direction, this other train being composed of express cars drawn by two locomotives. Both of the engines of this train were derailed and fell against the freight train, knocking over several freight cars. The explosion of the boiler is said to have been due to low water.

[1] Abbreviations and marks used in Accident List:
rc, Rear collision——bc, Butting collision——xc, other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unv, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc. ——boiler, Explosion of locomotive on road——fire, Cars burned while running—P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

Of the half dozen electric-car accidents reported in the newspapers as occurring in the United States in the month of November, one in Chicago resulted in injuries to 12 persons, and one in Kalamazoo, Mich., in the death of six and injuries to 26. In both of these cases an electric car was struck by a locomotive on a grade crossing. In the Kalamazoo case it is said that the conductor of the street car had gone forward, according to the rule, to look out for trains on the steam road and that he stood between the two main tracks of the steam road as the train approached; but he says that when he gave the signal to his car to proceed over the crossing he neither saw nor heard the approaching locomotive. The front part of this electric car was completely crushed; but in the rear part a number of passengers were imprisoned and received many burns and electric shocks, after the car was struck by the engine, by reason of the presence, in the metallic parts of the car, of a considerable electric current, which continued until the trolley was disconnected from the overhead wire.

FOREIGN RAILWAY NOTES.

The municipality of Bogota, Colombia, after a successful boycott, forced the owners of the Bogota City Railway Company to sell out for $800,000. The final payment of $375,000 was made by the city on December 8.

The narrow gage railway which was built by the Japanese government from Otomari (Karsakoff) to Toyohara (Vladimiroff), 25 miles, is now being rebuilt. The curves and grades are being eliminated and the narrow gage tracks replaced by standard gage tracks. This line will be extended from Toyohara northward to the east coast of Japanese Sakhalin at Sakaima.

The Moscow-Windau-Rybinsk Railway has recently bought an electric accumulator car of Russian make, for experimental and demonstrative purposes. The car cost 75,000 rubles ($38,625) and is to develop a speed of 35 to 67 miles per hour. This car is to run on the line between St. Petersburg and Tsarskoye-Selo, and should it give satisfactory service, more cars will be installed by the railway company.

General News Section.

The Union station at Newcastle, Pa., was destroyed by fire December 13. Estimated loss, $40,000. This station was occupied by the Pennsylvania, the Erie, the Baltimore & Ohio and the Pittsburg & Lake Erie.

The Michigan Central has recently installed Western Electric apparatus for train despatching on its lines between Jackson and Niles; Jackson and Bay City, and Jackson and Grand Rapids; and similar equipment will soon be put up on the line between Windsor, Ont., and St. Thomas.

Representative Rainey, of Illinois, a democrat, has introduced in Congress a resolution calling for an investigation, by five members of the House, of the traveling expenses of Theodore Roosevelt while he was president, the purpose being to find out to what extent Mr. Roosevelt rode free and how he secured favors of that kind.

In the federal court at Indianapolis, Ind., last week, the Baltimore & Ohio, the Cleveland, Cincinnati, Chicago & St. Louis, the Indianapolis Union, the Chicago Terminal, the Chicago, Indianapolis & Louisville and the Pennsylvania were fined for violation of the safety appliance laws. Most of the counts in the indictments had to do with insecure coupling apparatus and handholds.

The Twenty-eighth and Twenty-ninth streets cross-town street railway, New York City, which hitherto has been worked with horses, is now equipped with fifteen electric cars, propelled by power from Gould storage batteries. Cars of this make have been run a distance of more than 100 miles on a single charge of the batteries. Storage battery experiments were made on this line several years ago.

The railroad commissioners of Indiana have filed suit in the superior court of the state to recover penalties from the Chicago, Indianapolis & Louisville for the failure of the road to obey the law requiring the installation of the block system. The commission granted an extension of time of one year to July 1, 1910, but since then the road has neglected to comply. The statutory penalty for noncompliance is $1,000 a week.

On the Hudson & Manhattan lines beneath the Hudson river, between New York and Jersey City, business was suspended last Monday for 4 hours and 40 minutes, by reason of a fire in the company's power house at Washington and Bay streets, Jersey City The fire started about 4:45 a. m., and all of the morning passengers from Jersey City for New York City, usually traveling by these lines, were obliged to cross by the ferry boats. From seven o'clock to 9:30 every boat was crowded.

The striking machinists, blacksmiths, boilermakers and other shop men of the Missouri Pacific returned to work last Wednesday, accepting the company's offer of three cents an hour increase in pay, which offer was made last May. The machinists struck May 2, but the other trades did not join the machinists until October 21. An officer of the road says that the men have made a complete surrender and have acquiesced in the rules adopted by the railways at Chicago last March.

The electrification of Chicago railway terminals was taken up by the Chicago city council on December 19. The president of the Association of Commerce presented a formal announcement that a committee from that association had carefully considered this problem and now desired the aid of the city. In accordance with this request, the mayor appointed four members of the council to cooperate with that committee. At the same meeting an ordinance was introduced to compel all steam roads to electrify their lines throughout a radius of seven miles from the city, the work to be completed by January 1, 1913. No action was taken on the ordinance.

The representatives of the Brotherhood of Locomotive Engineers last week rejected the proposition of the Managers' Committee, headed by W. B. Scott of the Harriman Lines, that the engineers either accept the offer of the railways of advances in wages averaging 9½ per cent., or submit the entire question to meditation by Messrs. Knapp and Neill. The Erdman act provides that either or both of the parties to a labor dispute may ask for meditation, and, in accordance with this provision, the managers' committee immediately wired to Chairman Knapp and Commissioner Neill asking them to undertake to mediate between the railways and their employees. The employees after this decided to accept mediation. Mr. Scott in a public statement said that the offer of the railways if accepted would have increased the pay of locomotive engineers in every branch of the service, on the 61 roads represented, from 7½ to 14½ per cent. "without changing in any manner the long established basis of a day's work or methods of computing time for overtime."

Disastrous Explosion at the Grand Central Terminal.

By an explosion of gas, what kind of gas is not yet known, on the morning of Monday, December 19, the sub-station of the power system of the New York Central, electric division, at Fiftieth street, New York City (the northeast corner of the terminal yard), was almost completely demolished, and windows were broken in scores of buildings within a radius of half a mile. Ten or more persons were killed and over 100 seriously injured, some of the killed being passengers in a street car which was passing at the time and which was overturned by the force of the blast. About a half hour before the explosion a pipe conveying Pintsch gas was broken by a passenger car, which, in being pushed to the end of a yard track for the purpose of having its supply of illuminating gas replenished, was run at uncontrolled speed and broke over the bumping post. But, so far as can be learned at the present writing, there is much conflict and doubt in the testimony as to just what occurred and as to why the dangerous flow of gas was not discovered and stopped. Also, while the explosion has so far been generally attributed to gas from this pipe, it has not been explained how it could have got inside of the building so as to form an explosive mixture in a confined place. The pipe was outside of the building and there are no windows on that side of the building. Agents of the plate glass insurance companies estimated that their losses in the region of the explosion would amount to $25,000.

Ties of Eucalyptus Obliqua.

A shipment of 70,000 railway ties of "stringy bark" (Eucalyptus obliqua), sometimes termed Tasmanian oak, left Hobart for the United States in October. Two similar shipments will follow, making a total of 210,000 sleepers of Tasmanian timber for the United States. Stringy bark is much in demand for railway sleepers, being nearly everlasting. Some forest tramways in use by Tasmanian sawmills were laid with stringy-bark sleepers more than fifty years ago, and they are still perfectly sound. The average life of these sleepers resting on gravel ballast and subjected to a rainfall varying between 20 and 60 inches per annum is about fifteen years. The wood is practically non-inflammable, and this is especially suitable for underground railways. It is comparatively immune from the ravages of white ants and other land insects, and also is especially suitable for harbor construction, being one dense and immune from the attacks of marine insects. A sample of the wood was recently taken from a Hobart pier after being under water for thirty to forty years and it was perfectly sound.—*Consular Reports.*

Jersey City to Washington in 244 Minutes.

A special train was run over the Central of New Jersey, the Philadelphia & Reading and the Baltimore & Ohio last Friday morning from Jersey City, N. J., to Washington, D. C., in four hours and four minutes, which is seven minutes better than the best time ever before made between the two cities. Exact comparisons cannot be made, as the best record made heretofore was over the Pennsylvania (November 28, 1891), and the distances are slightly different over the different routes; and, moreover, they have been changed since the last record runs by

the establishment of the new Union station in Washington. The new Reading cut-off north of Philadelphia has also shortened the line. The distance traversed by this train appears to be about 227 miles, making the rate of speed 55.8 miles an hour. The temperature on the morning of this run was about 12 deg. above zero, and there was a strong northwest gale blowing. Besides this drawback it was necessary to use six minutes in changing engines at Philadelphia, instead of the two minutes allotted, because of the ice on the couplings; and speed had to be reduced at three places south of Philadelphia where the line was undergoing repairs. The train was run for an English newspaper reporter.

Reduction of Dues in Reading Relief Association.

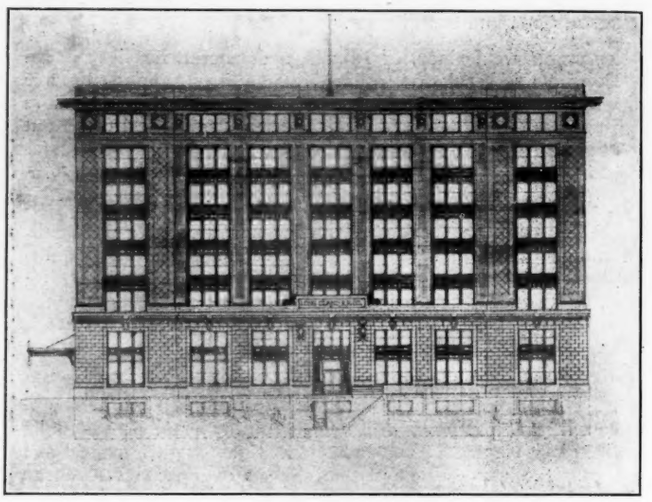
The advisory committee of the relief association of the employees of the Philadelphia & Reading has announced that beginning January 1, there will be a reduction in the dues assessed against the older members, the association having now a surplus fund amounting to more than $670,000. To members who have belonged to the fund for 21 years and are still in the service, the reduction will be 33 1-3 per cent., equal to $3 a year, for the men receiving the lowest wages, and $15 a year for the fifth or highest grades. Where an employee is disabled by accident, payments will be continued beyond the present limit of 52 weeks, but at half rates; this to be continued as long as the disability continues or until the employee has been offered work in the service of the road suitable to his capacity. This applies to all members of the fund without regard to the length of time they have been members. Payments for disablement by sickness are also to be extended the same way, but this applies only to those who have been members 15 years. This association was established in 1888 and now has 23,000 members.

Freight House at Frederick, Md.

The engraving shown herewith is from a photograph of the freight house of the Baltimore & Ohio at Frederick. Frederick is 61 miles from Baltimore, and in the early days was for a time the western terminus of the road. This building was erected in 1831 on land which was given to the company by the city of Frederick. It was originally used as a passenger station. A correspondent who sends us the photograph calls this the oldest freight house in the world, a statement which very likely would be challenged in a number of places in England. The Frederick freight house is still in use and in good repair. The multiplicity of telegraph, telephone and electric light wires shown in the picture affords an interesting suggestion of the changes in railway practice which have taken place during the life of the building. It was along the right-of-way of the Baltimore & Ohio that the first telegraph line in America was put up, but this building, it appears, had been in use 13 years before the occurrenc of that event.

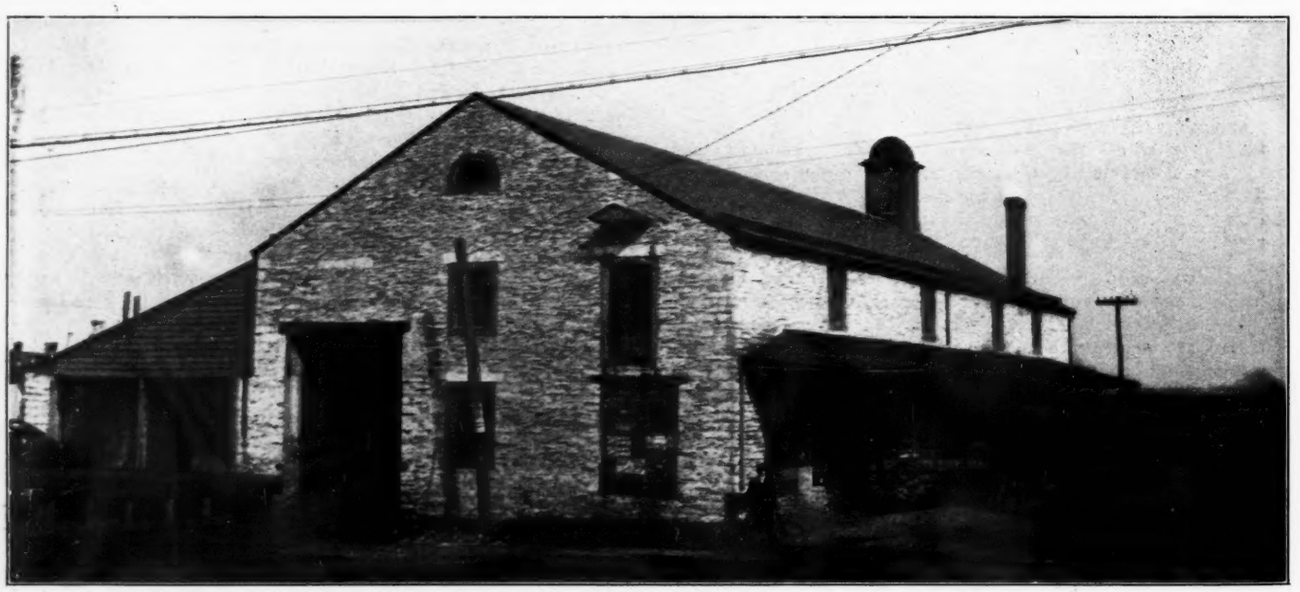
New Passenger Station for the Long Island at Jamaica.

The Long Island Railroad has started construction work on the new station at Guilford street and Archer place in Jamaica, N. Y. The building is to be 70 ft. x 174 ft., four stories high, with a temporary roof built so that four additional stories can be added to the building. The station will be of fireproof construction throughout, with steel skeleton on concrete foundations. The walls will be faced with dull glazed terra cotta. The main waiting room will be decorated with Rockwood Faience tile, and the



Station and Office Building, Jamaica, N. Y.; Long Island Railroad.

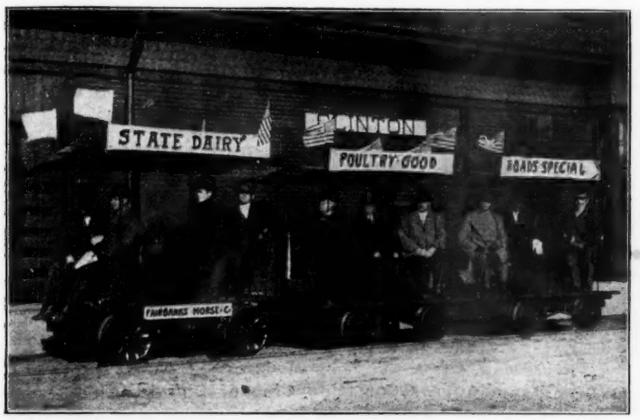
various retiring rooms will be made to conform. There will be a tunnel underneath the tracks leading from the waiting room to the station platforms, and the platforms will be protected with umbrella sheds. The new Jamaica station is part of the scheme of improvements which the Long Island Railroad is making at that point. Various cross-over tunnels are being built so that no tracks will cross others at grade. It is expected that the station work will be completed by the spring of next year, while the other work on the Jamaica improvement will not be finished until later in the year.



Freight House of the Baltimore & Ohio Railroad at Frederick, Maryland; Built 1831.

A New Style in "Farmers' Specials."

The latest enterprise in the field of "university extension" as applied to argricultural knowledge is that of the agricultural experts of Missouri and Kansas, apparently the two states combined, in a trip over the Kansas City, Clinton & Springfield recently. The professors and lecturers traveled in a train of three Fairbanks-Morse gasolene motor cars. The placards on the cars of this train, as shown in the accompanying picture, seem to indicate that the teachings of these gentlemen may have been



Farmers' Special on the K. C. C. & S.

somewhat disjointed, but we are assured that the expedition was highly successful and that nearly 5,000 farmers listened to the lectures, in which were included the subjects of poultry raising and good roads. The expense of this train was of course much less than would have been required to run a locomotive and full sized cars.

Hearings in New York by Hadley Railroad Securities Commission.

The Railroad Securities Commisison, consisting of Arthur T. Hadley, chairman; Frederick N. Judson, Frederick Strauss, Walter L. Fisher, B. H. Meyer and W. E. S. Griswold, has been holding hearings in New York in the last part of last week and beginning of this week. The more important witnesses, in the order in which they testified, were as follows: Richard Hale, a corporation lawyer of Boston Mass.; Milo R. Maltbie, member of the New York Public Service Commission, First district; Francis Lynde Stetson, legal representative of the Morgan interests; Frank W. Stevens, chairman of the New York Public Service Commission, Second district; Robert S. Brookings, a St. Louis banker and manufacturer; Jacob H. Schiff, of the banking firm of Kuhn, Loeb & Co., New York; W. M. Acworth, an English economist and author of "Elements of Railway Economics"; Paul D. Cravath, a New York corporation lawyer, and Edward M. Shepard, a New York lawyer.

Mr. Hale laid especial emphasis on the desirability of having issues of stock with no par value. He believed that the original or present value of a railway should be used as a basis for issuing new securities . He also believed that rates should be "mostly determined on a basis of property valuation rather than capitalization." The board of directors of the corporation said Mr. Hale should name the price at which new stock should be sold, providing, of course, stockholders are permitted to subscribe pro rata. There should, however, be effective regulation of the uses to which the money received from the sale of stock should be put.

Commissioner Maltbie testified that he believed the commission should have power to prevent the sale of stock of the corporation below par. He said that unless the strictest control is emphasized over corporations mere control of the details of stock issues amounts to very little. He believed that the commission should have the right to audit the accounts of corporations.

Mr. Stetson said that he regarded state regulation of the issue of railway securities as infinitely preferable to federal regulation. Mr. Stetson is framing a bill to be submitted to the New York legislature providing that a corporation may cancel the par value marked on certificates of stock by vote of its stockholders, the measure being permissive and not compulsory and applying to existing as well as new corporations. So far as rates are concerned, Mr. Stetson said that he thought overcapitalization had no effect on them at all. Mr. Stetson said that he disapproved of federal regulation of the issue of securities, both on grounds of economic expediency and on constitutional grounds. He was strongly of the opinion that any attempt on the part of the federal government to regulate the issue of new securities would be unconstitutional.

Chairman Stevens said that he did not think capitalization had much to do with the question of rates. He agreed with Mr. Stetson both in thinking it advisable to permit issues of stock without a par value and in strongly opposing federal regulation. He added that too great a tendency to assume the necessity of a rigid system of capitalization was entirely wrong.

Mr. Brookings was opposed to regulation of the issue ot new securities, but preferred federal regulation to state regulation. Any effort to etsablish a protectorate over investment he held to be politically and economically unwise. He made the point that investors pay no attention to denominational value of stock as related to actual value, and that expert examination is open to any investor who can read railway reports, or who can employ a more competent person to advise him. He advocated publicity, but thought that the government should not assume financial responsibility but actually regulate the price paid, for instance, for branch lines, etc. He held that rates cannot be fairly based on security par values nor on present physical valuation, but must be based on the total of what has been put into the road in money, time and brains.

Mr. Schiff was very strongly in favor of federal regulation as opposed to state regulation. In purely financial operations he distrusted all regulation, believing that a road should be allowed to deal with its own credit as best it could. He did not approve of issuing participation certificates with the par value eliminated.

Mr. Acworth said:

"Practically speaking, a railway company only comes into existence by special act of Parliament, called with us a 'private bill.' A railway company before it can come into existence has to comply with the standing orders of Parliament. Standing orders are not statutory, but practically have statutory force."

In the building of railways, Mr. Acworth declared, the bill provides for a limited time, normally five years, and a penalty of £50 ($250) a day in case the line is not opened within the prescribed period.

"The deposited bill," said Mr. Acworth "is subjected to a scrutiny of officers of both houses of Parliament, in order to see that nothing departing from precedent appears in it. If there be any such departure, it has to be explained and accounted for. In some cases the proposed departure is flatly refused; in other cases the proposal is permitted to go before a committee and to be discussed at length.

"Before the committee any proposal of the bill can be subjected to exhaustive investigation by the usual procedure of examination, cross-examination, and reëxamination of witnesses by counsel as in any ordinary law court.

"If the committee is convinced that the promotion is reckless or shows any taint of *mala fides,* that is almost sure to be fatal to the bill. So far, I have been speaking of new companies, but for very many years past almost the whole of the raising of railway capital has been done by the existing companies, and their cases differ fundamentally."

Railways cannot issue *mortgage* bonds and only one-quarter of their capitalization can be debenture bonds, the reaminder being stock.

"The Northwestern, let us say," he continued, "proposes to make a new line ten miles long at a cost of £250,000; it wants another half-mililon for the purchase of lands and enlargement of stations; it wants another million for rolling stock at once, and may want another million for similar purposes before long. It accordingly applies to Parliament for power to raise four millions, three million by shares, and one million by debentures. So far as the money is required for the construction of the new branch and the purchase of specific pieces of land, estimates will have to be deposited, but nobody is the least likely to challenge them, and if unchallenged by opponents, they will, as I have said, go unquestioned by the committee. Public control comes down to this.

"Counsel for the bill puts the question to the general manager: 'You have enumerated in your bill the objects for which

you require money, and you have described the land you require. Are you responsible for this, and is it correct?' 'Yes'; and upon this the committee instantly and unanimously decides that the bill may proceed.

"There are a good many statutory restrictions on the company's dealings with its capital after the bill has become an act, but legal ingenuity between 1845 and 1910 has done a good deal to nullify their effect. For example: I pointed out that borrowing powers are restricted to one-fourth of the authorized capital, but it is not illegal to issue an acknowkledgment of obligation, technically known as a 'Lloyd Bond,' in payment for work done, and such a bond naturally takes precedence of dividends on shares. Debentures may only be issued until half the share capital is paid up, but there is nothing to prevent the company the day after it is constituted issuing the whole of its share capital to a contractor fully paid up, and then proceeding to put in force its borrowing powers."

In reply to a question from one of the commisison, Mr. Acworth said that every bill authorizing the construction of a railway in the kingdom contained a clause fixing the maximum rates and charges.

Mr. Cravath said that the question was the delicate one of morals and that in his opinion, publicity would prevent whatever abuses exist in that direction. He contended that the notion that all dealings between such corporations were immoral was a false one. When he spoke of publicity he said he meant that in cases where such transactions involved the sale of stock by directors in one corporation to another corporation in which they were officers he would require that the amount of their holdings and the price paid for them should be disclosed.

Going more into detail regarding his views on the question of over-regulation, Mr. Cravath said that he believed that any arbitrary requirements, for instance, as to their issuance of securities, the price received for them, the purposes of their issue, etc., would be dangerous. He believed that if corporations were required to reveal in advance the specific purposes for which the securities were to be sold, it would much hamper the corporations. For example, he said he had been told that, in good time, if it were known in advance that a corporation was to spend a large sum of money for equipment, that corporation was under an immediate disadvantage in securing the best terms from the equipment companies.

As to the regulation of the price at which securities could be sold, Mr. Cravath stated that he would draw a sharp distinction between bonds and stocks. He differed, however, from most of the other witnesses who have thus far appeared before the commission as its session in New York, in that he would have the flexibility attach to issues of stocks rather than to issues of bonds. He believed that the present laws respecting stock issues were adequate, but that greater restriction should be placed upon the issuance of bonds. He would favor any scheme of regulation which should say that bonds could only be issued at a fair market value. He would also have the amount of bonds bear some relation, not to nominal capitalization, but to the amount of money actually put into the property by the stockholders. He said he would provide that bonds should be issued for money or for certain classes of property. He was strongly of the opinion that large issues of collateral trust bonds which had for the basis of their security the stocks of other corporations, were economically dangerous.

Mr. Cravath stated that the defect of the present system of laws regarding stock issues was that there was no statue defining clearly what the stock represents. Incidentally, he said he was an advocate of a permissive law for the issuance of stock without par value.

Discussing the question of rates, Mr. Cravath said he thought it would be unjust for the government to attempt to interfere in any way with the present return on the securities of the existing railways, which he did not believe were capitalized unconservatively. He said that in rate making there was undoubtedly a relation between the structural value of the railways and their outstanding capitalization, in which the public was interested, but he did not hold it to be an important one.

At the conclusion of Mr. Cravath's testimony, Edward M. Shepard took the stand and was questioned about the provisions of the bill prepared by the committee of which he is a member, looking to permissive legislation for the issuance of stock without par value. He said he believed such a measure would prove to be a remedy for most, if not all, of the evils now existing in connection with stock issues. He said he had never seen why nominal capital, or bonds, of themselves, should have any bearing upon rates. They should be determined, he believed, by consideration of the question as to what are the underlying realities, such as cost, etc.

Mr. Shepard would not express a definite opinion, but said he was much in doubt as to the constitutionality of Federal Government's power to require Federal incorporation, or to regulate the capitalization of corporations engaged in interstate commerce. He declared that the enforcement of the utmost publicity would accomplish all of the ends sought. In his opinion it would be unwise for the government to undertake the protection of investors, who, he said, did not need it, much preferring to be guided by the opinions of the reputable bankers.

Traffic Club of New York.

A meeting will be held at the Waldorf-Astoria on Tuesday, December 27, at 8 p. m. The address which has been announced for this meeting to be delivered by the Hon. Walker D. Hines has been postponed to the January meeting. The entertainment committee has arranged for the Mendelssohn Quartette to furnish an entertainment, and in addition a buffet luncheon will be served. Guest tickets may be secured, as usual, from C. A. Swope, secretary. The board of governors have changed the date of the regular meeting in January to the 17th.

The Transportation Club of Buffalo.

The Transportation Club of Buffalo elected on December 9 the following members to the board: George E. Chase, traveling passenger agent of the St. Paul; Charles L. Couch, vice-president of the F. W. Weaver Coal Company; John B. Harris, Philadelphia Coal & Iron Company; Peter Palmateer, assistant passenger agent of the Santa Fe; James A. Stevenson, general agent of the Mutual Transit Company.

American Society of Civil Engineers.

At the meeting held in New York on Wednesday, December 21, two papers were presented for discussion, as follows: Notes on the Bar Harbors at the Entrances to Coos Bay, and Umpqua and Siuslaw Rivers, Oregon, by Morton L. Tower, M. Am. Soc. C. E., and Timber Preservation, Its Development and Present Scope, by Walter Buehler, M. Am. Soc. C. E. These papers were printed in the November number of *Proceedings.*

International Railway General Foremen's Association.

The convention of the International Railway General Foremen's Association will be held in Chicago, July 25-27, 1911, instead of in May.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass.

American Association of Demurrage Officers.—A. G. Thomason, Scranton, Pa.; next meeting, June 22, 1911; Niagara Falls, N. Y.

American Association of General Passenger and Ticket Agents.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn., 1911.

American Association of Local Freight Agents' Association.—G. W. Dennison, Pennsylvania Co., Toledo, Ohio.

American Association of Railroad Superintendents.—O. G. Fetter, Carew building, Cincinnati, Ohio.

American Electric Railway Association.—H. C. Donecker, 29 W. 39th St., New York.

American Railway Association.—W. F. Allen, 24 Park Place, New York.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago; Sept. 17-19, 1911; St. Louis, Mo.

American Railway Engineering and Maintenance of Way Association.—E. H. Fritch, Monadnock building, Chicago; March 21-23, 1911, Chicago.

American Railway Industrial Association.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; May 6, 1911; Detroit, Mich.

American Railway Master Mechanics' Association.—J. W. Taylor, Old Colony building, Chicago; June 14-16, 1911, Atlantic City, N. J.

American Railway Tool Foremen's Association.—O. T. Harroun, Bloomington, Ill.

American Society for Testing Materials.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wednesdays, except July and August; annual, Jan. 18-19, New York.

American Society of Engineering Contractors.—D. J. Haner, 13 Park Row, New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 29th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911; New Orleans, La.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911; Montreal, Can.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—G. B. Colegrove, I. C. R.R., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911; Boston, Mass.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Place, New York; June 20-21, 1911, Cape May City, N. J.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tuesday in month, except June, July and Aug.; Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays; Montreal, annual, last week January.

CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—D. F. Jurgensen, 116 Winter St., St. Paul, Minn.; 2d Monday, except June, July and Aug.; St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday; annual, Jan. 17, 1911; Pittsburgh.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich., Fred. & Pot. R.R., Richmond, Va.; 20th annual, June 21, 1911; St. Paul, Minn.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—H. D. Judson, 209 East Adams St., Chicago; Wednesday preceding 3d Thursday; Chicago.

INDIANAPOLIS RAILWAY AND MECHANICAL CLUB.—B. S. Downey, C., H. & D., Indianapolis, Ind.

INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 15-18, 1911; Chattanooga, Tenn.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn. Next convention July 25-27, Chicago.

INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.

IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 19-21, 1911, Atlantic City, N. J.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION, OF UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept.; Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.

NORTH-WEST RAILROAD CLUB.—T. W. Flannagan, Soo Line, Minn.; 1st Tues. after 2d Mon., except June, July, August; alternately at St. Paul and Minneapolis, Minn.

NORTHERN RAILWAY CLUB.—C. L. Kennedy, C., M. & St. P.; 4th Saturday; Duluth, Minn.

OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Blk.; second Wed.

RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City; 3d Friday in month; Kansas City.

RAILWAY CLUB OF PITTSBURGH.—C. W. Alleman, P. & L. E., Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio; annual, May 22-24, 1911; Milwaukee, Wis.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Oct., 1911; St. Louis.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Prudential bldg., Atlanta, Ga.; 3d Thurs.; Jan., April, August and Nov.; Atlanta.

TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo; 1st Sat.; annual, May 6, 1911; Toledo.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York; Jan. 17.

TRAFFIC CLUB OF PITTSBURGH.—T. J. Walters, Oliver building, Pittsburgh, Pa.; meetings monthly; Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911; Baltimore, Md.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August; Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, First National Bank bldg., Chicago; annual, Jan. 17-19, 1911; Chicago.

Traffic News.

The Senate has adopted a resolution calling on the Interstate Commerce Commission for the testimony taken in the recent hearings on the proposal to increase freight rates. This testimony fills a trifle of 10,000 pages.

The transcontinental lines have agreed to suspend the proposed advances in rates on hard wood lumber to the Pacific coast until after an investigation of their reasonableness. The first hearing will probably be held by the Interstate Commerce Commission in the latter part of March.

J. S. Taylor, foreign freight agent of the Southern and the Mobile & Ohio, at Mobile, announces the establishment of the Seeberg steamship line, which is to make regular trips between Mobile and ports in Haiti, San Domingo and the Lesser Antilles. The first sailing was appointed for December 21. Mr. Taylor sent a representative with the first trip of the steamer, with a view to working up freight business between the United States and the countries named; and in instructing the agents of his roads to solicit business for the new line he gave them an elaborate condensation of the commercial history on the countries.

Crop Conditions.

The final estimates of the department of agriculture indicate the harvested acreage, production, and value of important farm crops of the United States, in 1910 and 1909, to have been as follows:

CROPS.	Acreage. (000 omitted.)	Production. (000 omitted.)	Farm Value, December 1. Per Bu.	Farm Value, December 1. Total. (000 omitted.)
	Acres.	Bushels.	Cents.	Dollars.
Corn, 1910.....	114,002	3,125,713	48.8	1,523,968
Corn, 1909.....	108,771	2,772,376	59.6	1,652,822
Winter wheat, 1910.	29,427	464,044	89.1	413,575
Winter wheat, 1909.	28,330	446,366	102.9	459,154
Spring wheat, 1910.	19,778	231,399	89.8	207,868
Spring wheat, 1909.	18,393	290,823	93.1	270,892
All wheat, 1910....	49,205	695,443	89.4	621,443
All wheat, 1909....	46,723	737,189	99.0	730,046
Oats, 1910.....	35,288	1,126,765	34.1	384,716
Oats, 1909.....	33,204	1,007,353	40.5	408,174
Barley, 1910.....	7,257	162,227	57.8	93,785
Barley, 1909.....	7,011	170,284	55.2	93,971
Rye, 1910.....	2,028	33,039	72.2	23,840
Rye, 1909.....	2,006	32,239	73.9	23,809
Buckwheat, 1910....	826	17,239	65.7	11,321
Buckwheat, 1909....	834	17,438	69.9	12,188
Flaxseed, 1910.....	2,916	14,116	230.6	32,554
Flaxseed, 1909.....	2,742	25,856	152.6	39,466
Rice, 1910.....	722	x24,510	67.8	16,624
Rice, 1909.....	720	24,368	79.4	19,341
Potatoes, 1910.....	3,591	338,811	55.5	187,985
Potatoes, 1909.....	3,525	376,537	54.9	206,545
Hay, 1910.....	45,691	*60,978	$12.26°	747,769
Hay, 1909.....	45,744	*64,938	$10.62°	689,345
Tobacco, 1910.....	1,233	†984,349	‡9.3	91,459
Tobacco, 1909.....	1,180	†949,357	‡10.1	95,719

* Tons. ° Per ton. † Pounds. ‡ Per pound. x Equivalent to 5,930,000 bags of 186 pounds, average weight.

The total value of crops above specified on December 1, 1910, was $3,735,464,000, against 3,971,426,000 on December 1, 1909. The average of prices was about 8.5 per cent. lower on December 1, 1910, than on December 1, 1909.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 85, giving a summary of car shortages and surpluses by groups from August 4, 1909, to December 7, 1910, says:

"The surplus shows an increase of 10,849 cars between November 23 and December 7, bringing the total to 53,915. For the same period in 1909 the surplus was 57,470 cars or 3,555 cars more than at the date of this bulletin. The increase in the surplus during the corresponding fortnight last year was 17,942 cars. The shortage for this report is 11,901 cars. While this total is 6,692 cars less than the shortage on the corresponding date of 1909, the decrease in shortage since our last bulletin is only 2,772 cars as against a decrease of 8,903 cars in the corresponding period last year.

"The increase in surplus for the entire country as between box and coal cars was in proportion to the existing surplus of these

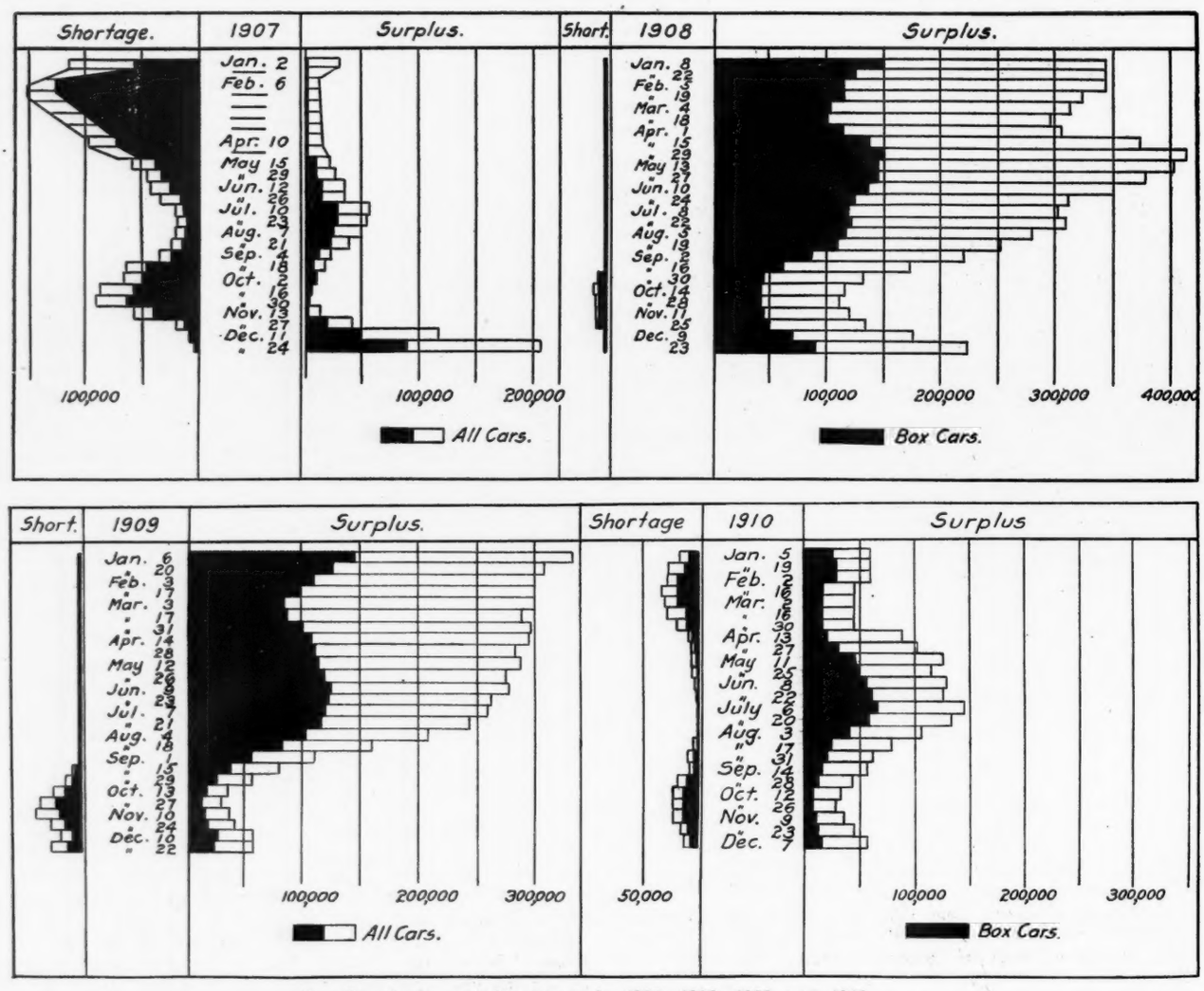
classes, being 4,427 cars for the former and 3,532 for the latter, with 2,511 increase in miscellaneous. Taken by groups, however, box cars show a decrease of 1,593 in group 6 (Northwestern), and of 135 cars in group 3 (Central), these decreases being more than offset by increases in the other groups, particularly in group 10 (Pacific), and 11 (Canadian), where the increases were heavy. In coal and gondolas, group 6 (Northwestern), alos shows a decrease, while the surplus of this class increased heavily in group 3(Central)."

The accompanying table gives car surpluses and shortages by groups for the last period covered by the report, and the charts show total surpluses and shortages in 1907, 1908, 1909 and 1910:

CAR SURPLUSES AND SUORTAGES.

Date.	No. of roads.	Surpluses Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—December 7, 1910	8	221	704	277	333	1,535	242	175	0	425	842
" 2.— " 7, 1910	25	2,747	148	1,246	4,862	9,003	6	2	930	41	979
" 3.— " 7, 1910	26	2,199	396	4,340	2,575	9,510	125	3	403	1,162	1,693
" 4.— " 7, 1910	10	323	12	278	623	1,236	1,396	329	1,426	6	3,157
" 5.— " 7, 1910	18	100	26	150	555	831	1,879	441	375	0	2,695
" 6.— " 7, 1910	19	4,761	793	1,345	3,870	10,769	161	10	24	349	544
" 7.— " 7, 1910	4	376	86	547	707	1,716	0	0	0	0	0
" 8.— " 7, 1910	13	1,103	68	721	1,894	3,786	275	108	13	17	413
" 9.— " 7, 1910	10	1,112	142	334	633	2,221	355	25	0	0	380
" 10.— " 7, 1910	21	2,182	1,093	1,496	5,499	10,270	283	0	28	91	402
" 11.— " 7, 1910	5	1,671	417	47	903	3,038	713	0	0	83	796
Total	159	16,795	3,885	10,781	22,454	53,915	5,435	1,093	3,199	2,174	11,901

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland, and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia, and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and the Dakotas lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages in 1907, 1908, 1909 and 1910.

INTERSTATE COMMERCE COMMISSION.

The Interstate Commerce Commission's hearing in the cases involving the advances in rates between Mississippi and Missouri rivers has been postponed indefinitely.

Judges of the Commerce Court.

Announcement of the appointment of members of the Commerce Court by President Taft was made in the *Railway Age Gazette* of last week, page 1162, and some comments were printed in the editorial columns.

Martin Augustine Knapp, A. M., LL. D., who is appointed for

five years, and who will be the presiding judge, has been a member of the Interstate Commerce Commission since 1891, and chairman of that body since January, 1898. Mr. Knapp was born at Spafford, N. Y., November 6, 1843, and was graduated from Wesleyan University in 1868. His home is in Syracuse, N. Y., and he was corporation counsel of that city for seven years, 1877-1883. His work on the Interstate Commerce Commission is well known to the readers of the *Railway Age Gazette*. Mr. Knapp's nomination was confirmed December 20.

Robert Wodrow Archbald, the second member of the court, has been judge of the United States District Court for the middle district of Pennsylvania since 1901. His home is at Scranton, Pa. Mr. Archbald was born at Carbondale, Pa., September 10, 1848, and was graduated from Yale in 1871. He was a judge of the state courts in Pennsylvania from 1885 to 1901.

R. W. Archbald.

Martin A. Knapp.

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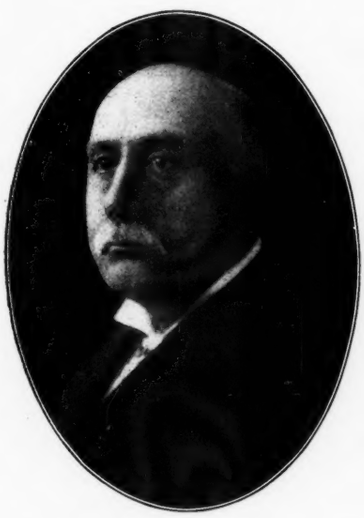


John E. Carland.

Photo by Edmonston, Washington.
B. H. Meyer

Photograph by Moffett, Chicago.
J. W. Mack.

William Henry Hunt, A. M., was born at New Orleans November 5, 1857, the son of William H. Hunt, Secretary of the Navy. He was educated at Yale, but was prevented from graduating by ill-health. He has been in governmental service since 1881; first as collector of customs in Montana and Idaho; then attorney-general of Montana; member of the Montana legislature; district judge (six years); justice of the Supreme Court of Montana (seven years); secretary of Porto Rico; governor of Porto Rico (four years); and United States district judge for the district of Montana from 1904 until the beginning of the present year, when he was appointed an associate judge of the newly established court of customs appeals. His home is at Helena, Mont.

John Emmett Carland has been United States district judge in South Dakota since August 31, 1896. He was born at Oswego, N. Y., December 11, 1853; son of Captain John Carland, U. S. A. He was admitted to the bar in 1875 and was district attorney and judge in Dakota territory previous to his appointment as federal judge. He was a member of the North Dakota constitutional convention in 1889. His home is at Sioux Falls, S. D.

Julian William Mack, of Chicago, has been for the past seven years county judge in that city. He has been prominent as a jurist, and even more prominent as a citizen. For years his name has been identified with every movement for the betterment of civic conditions, and he has also given much time to charitable work.. He was admitted to the bar in 1890; was a professor of law in the law school of Northwestern University from 1895 to 1902, and since 1902 has been a professor of law at the University of Chicago. He was appointed a member of the Civil Service Commission of Chicago in January, 1903, but resigned in May of the same year to become judge of the circuit court of Cook county. In 1904 he was assigned as judge of the juvenile court of Chicago, in which office he made a distinguished reputation for those philanthropic motives and good sense that are necessary to the proper performance of the duties of such an office. He was assigned as a judge of the appellate court of the first Illinois district in 1909. He is an ex-president of the Conference of Jewish Charities; president of the Milk Commission, of the League for the Protection of Immigrants, and of the Friends of Russian Freedom; vice-president of the Children's Hospital Society and of the Society for Social Hygiene; a member of the executive committee of the National Conference of Charities and Corrections, the Chicago School of Civics and

Philanthropy, the Chicago Tuberculosis Institute and the Juvenile Protective League; a director of the Civil Service Association, the Play-Ground Association and the Associated Jewish Charities. Judge Mack was born in San Francisco, July 19, 1866. He was graduated from Harvard University in 1887, and subsequently studied at the universities of Berlin and Leipsic, Germany. In politics he is a Democrat.

New Interstate Commerce Commissioners.

Balthasar Henry Meyer, new member of the Interstate Commerce Commission, was born in 1866 at Mequon, Ozaukee county, Wis. He grew up on a farm; taught district school in 1884-86; was principal of the village school at Fredonia, Wis., 1887-88, and principal of the high school at Port Washington, Wis., 1889-92. He graduated in the Latin course from the Oshkosh Normal School in 1893, and from the academic department of the University of Wisconsin in 1894. He took a graduate course in economics, history and transportation at the University of Berlin, Germany, in 1894-95, and was honorary fellow and extension lecturer at the University of Wisconsin in 1895-96. He was a university fellow at the same university in 1896-97, and received from his *alma mater* the degree of Ph. D. in the latter year. He became an instructor in political economy in 1897, assistant professor in 1899, and professor of political economy in 1900. He has continued his university work while serving on the commission. He has done special work for the Industrial Commission, the Interstate Commerce Commission and the Bureau of the Census, and has been director of transportation of the Carnegie Institution. Before his appointment to the Wisconsin commission he wrote about forty monographs and articles on transportation and other economic subjects, many of which were published in *The Railway Age* and the *Railroad Gazette*. His book, "Railway Legislation in the United States," was published by the Macmillan Company in 1903. He is a member of numerous economic, political science and historical societies.

The Wisconsin commission was created as a result of the successful war waged by Governor (now Senator) Robert M. La Follette against the so-called "stalwart" wing of the Republican party in Wisconsin. Having been the offspring of this political contest, it is a high tribute to those who originally and have since composed it that it has never allowed itself to be used—if any attempts have been made to use it—for political purposes. One of the things that first brought the Wisconsin commission into prominence was its opinions and decisions in the passenger rate cases in 1907. The 2-cent fare question had been pending before a number of State legislatures and commissions. The decisions applied only to the Chicago, Milwaukee & St. Paul, the Chicago & North Western and the Chicago, St. Paul, Minneapolis & Omaha, all of which, it was held, should reduce their rates from 3 to 2½ cents. The opinion was the most scientific and exhaustive discussion ever written on the way that the costs of railway transportation ought to be apportioned among the various kinds of traffic. It is understood that Mr. Meyer was the author of most of it, or, at least, of those parts of it dealing with the economic issues involved. Besides ordering the maximum rate reduced to 2½ cents, the commission recommended that the railways should sell mileage books for 2 cents a mile. The railways complied both with the commission's order and with its suggestion about mileage books.

The sort of stuff the commission was made of was shown when some time later a bill was introduced in the State legislature requiring a flat 2-cent rate. The members went before the legislature and tried to get it not to pass the bill. But the 2-cent fare craze had hit Wisconsin as hard as other states, and the bill was passed. It was chiefly in consequence of this that John Barnes resigned as chairman of the commission. The 2-cent fare law in Wisconsin has never been contested in the courts. It probably is only a matter of time, however, until it will be. The results of similar litigation elsewhere indicate that in this event it will be nullified.

In 1904 Mr. Meyer was appointed expert special agent representing jointly the Interstate Commerce Commission and the Bureau of the Census, and in that capacity had charge of the "Commercial Valuation of Railway Operating Property in the United States: 1904." The results of his work were published as Bulletin 21 of the Bureau of the Census, and constitute one of the most interesting and authoritative studies of American railways. Mr. Meyer was recently appointed by President Taft a member of the commission to investigate the subject of regulation of railway securities.

Charles C. McChord, the second new member of the Interstate Commerce Commission, like Mr. Meyer, has had experience as the chairman of a state railway commission. He formerly presided over the State Railroad Commission of Kentucky, having been appointed a member of the commission in May, 1892, and elected chairman of the board. He resigned in 1895 and was elected to the Kentucky state senate, where he served four years. While in the legislature he introduced and secured the passage of an act popularly known as the McChord railroad law, which empowered the commission to make reasonable interstate freight and passenger rates. He subsequently again became a member of the commission in 1899, also its chairman. He was re-elected commissioner and chairman in 1903 and retired in 1907, since which time he has been engaged in the practice of law. He was born on December 3, 1859, at Springfield, Ky., and was educated at Center College at Danville, Ky. After leaving college he practiced law at Springfield, Ky., being prosecuting attorney from 1886 to 1892.

Hearing on Ex-Lake Rates.

Commisisoner Prouty of the Interstate Commerce Commission took testimony in Chicago last week regarding the complaint of the Chicago Board of Trade against the eastern roads, that the adjustment of freight rates on grain from Buffalo to the Atlantic seaboard points is unreasonable. The rate is 2 to 5 cents higher when the grain moves to Buffalo by water than when it moves to that point by rail. This differential against grain moving to Buffalo by lake offsets the lower water rates from Chicago to Buffalo, and Chester A. Legg, attorney for the Chicago Board of Trade, and W. M. Hopkins, manager of its transportation department, charged that the purpose in making these rates is to drive the grain traffic from the lakes to the railways. Mr. Hopkins testified that the rate from Buffalo to Boston on grain brought to Buffalo by water is 5.3 mills per ton per mile, while on grain brought to Buffalo by rail it is only 3.6 mills per ton per mile. From Buffalo to New York on wheat the comparative rates are 5.3 and 4.4 mills per ton per mile, and on corn 4.6 and 4.4 mills.

Grain shippers gave testimony indicating that the effect of these rates is to cause the grain to move all rail. Captain Sullivan, a Chicago boat-owner, testified that one Chicago firm which up to 1907 shipped from 1,500,000 to 3,000,000 bushels of oats a year by boat now shipped all rail. He said that it had been made practicable by the expenditure of $110,000,000 by the government for improvements on the lakes to reduce lake rates, but that they had been reduced still further and to an unreasonable extent by the necessity imposed on the boats of offsetting in their rates the higher railway rates east of Buffalo.

B. D. Caldwell, vice-president of the Lackawanna, testified that the ex-lake rates from Buffalo could not be fixed in relation to the rates of the tramp boats, because the latter fluctuate while the railway rates have to be published 30 days in advance. He said that ex-lake rates are purely local rates fixed as reasonable of themselves, and that they have no reference to the divisions of the all-rail rates. One reason given by the witnesses for the railways for the difference between the ex-lake rates and the proportions of the through rail rates is the cost of transshipment and of switching incurred in handling the ex-lake grain.

T. N. Jarvis, vice-president of the Lehigh Valley, and F. La Bau, freight traffic manager of the New York Central Lines, denied the charge that a conspiracy existed among the railways to divert traffic from the water lines to the railways. Mr. Jarvis called attention to the fact that the Lehigh Valley has a reason for trying to foster rather than destroy lake traffic, in that it owns no railway line west of Buffalo, but does own and operate a line of lake boats, the Lehigh Valley Transportation Company. He said the ex-lake tonnage received by his road is about one-third greater than the rail tonnage received by it.

COURT NEWS.

Judge Kolhsaat of the federal court at Chicago has extended to February 15 his injunction restraining the Illinois railway commission from putting into effect its order fixing switching rates in Chicago. The continuance was agreed upon so as to allow time to close the negotiations between the railways and commercial organizations at Chicago for a settlement of the question.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF OCTOBER, 1910. (SEE ALSO ISSUES DECEMBER 9 AND 16.)

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	143	$108,074	$46,774	$166,613	$20,887	$26,094	$3,567	$56,006	$5,938	$112,477	$54,136	$172	$4,390	$49,918	—$1,943
Alabama Great Southern	309	275,302	88,976	399,074	45,624	86,971	8,303	121,375	9,452	271,725	127,349	—573	13,805	112,971	6,322
Ann Arbor	301	134,880	41,670	188,089	24,580	21,132	3,747	61,538	7,555	118,552	69,537	4,900	14,265	60,172	12,339
Baltimore & Ohio	4,434*	6,245,893	1,435,322	8,168,816	1,023,201	1,527,250	165,361	3,036,081	149,890	5,901,783	2,267,033	—333	209,914	2,056,786	—396,510
Bessemer & Lake Erie	204	778,783	26,107	813,254	83,330	134,738	7,691	215,465	7,222	448,446	364,808	.....	6,000	358,808	—101,636
Chicago & Erie	269	360,602	74,519	471,102	60,113	103,201	16,505	207,168	9,326	396,313	74,789	.....	11,387	63,402	—36,867
Cincinnati, New Orleans & Texas Pacific	337	633,781	136,540	808,416	81,976	151,738	17,164	211,767	19,337	481,982	326,434	—1,410	21,500	303,524	23,566
Colorado Midland	337	156,343	24,883	203,964	23,837	39,347	4,968	86,143	5,906	160,201	43,763	—351	8,500	34,912	—22,517
Detroit, Toledo & Ironton	441	171,058	14,718	200,377	32,546	32,797	2,708	95,142	5,101	168,294	32,083	3	6,712	25,374	11,747
Duluth & Iron Range	168	885,227	25,750	922,872	92,873	73,394	544	143,892	11,294	321,997	600,875	—148	37,066	563,661	—278,775
Duluth, Missabe & Northern	293	976,894	40,865	1,024,757	114,713	100,320	1,773	154,299	13,339	384,444	640,313	6,146	41,633	604,826	—685,012
Duluth, South Shore & Atlantic	608†	183,656	82,013	280,052	44,859	28,269	11,282	99,066	6,310	189,786	90,266	1,238	18,000	73,504	—19,172
Georgia	307	220,669	74,874	316,283	38,553	39,109	10,303	110,704	7,070	205,740	110,543	.....	1,723	108,820	590
Georgia Southern & Florida	395	114,913	67,523	207,891	21,458	39,923	5,612	73,610	10,095	150,698	57,193	.....	9,732	47,461	—3,969
Grand Trunk Western	347‡	365,308	173,813	575,236	83,244	79,553	18,775	238,213	12,864	432,649	142,587	—2,472	31,697	108,418	—17,492
Hocking Valley	350	630,280	83,855	759,569	87,484	122,083	8,874	209,929	15,211	443,581	315,988	.....	31,290	284,698	—31,628
Illinois Central	4,550	3,777,891	1,165,784	5,584,732	783,790	1,108,080	108,083	1,770,096	104,067	3,874,116	1,710,616	—9,453	218,000	1,483,163	189,245
International & Great Northern	1,159	716,927	194,552	962,417	106,264	123,215	17,371	341,291	20,553	608,694	353,723	—325	23,000	330,398	73,845
Iowa Central	558	273,309	48,439	334,160	36,540	64,314	6,424	130,607	8,782	246,667	87,493	.....	9,803	77,690	—20,555
Kanawha & Michigan	175	252,398	32,582	290,685	27,167	53,767	1,960	76,999	6,214	166,107	124,578	—10	8,463	116,105	32,856
Minneapolis & St. Louis	1,027	391,180	103,837	524,091	56,747	64,147	12,103	186,908	14,356	334,261	189,830	—53	22,965	166,812	—31,768
Minneapolis, St. Paul & S. S. Marie	3,572§	1,480,513	440,809	2,044,966	211,016	269,597	48,249	703,066	40,548	1,272,476	772,490	18,045	109,787	680,748	—676,839
Missouri Pacific	3,920¶	1,674,082	469,590	2,371,818	370,749	365,345	77,850	1,000,246	68,395	1,882,585	489,233	—2,290	83,500	403,443	—312,448
Morgan's La. & Tex. R.R. & S.S. Co.	348	293,214	105,964	424,292	54,006	49,007	12,954	152,576	13,077	281,620	142,672	—4,671	17,756	120,245	—40,457
New Orleans & North Eastern	196	224,111	49,568	291,133	29,430	39,689	8,950	102,918	10,721	191,708	99,425	79	8,250	91,254	—23,607
New York, Susquehanna & Western	151	185,549	54,785	268,542	38,585	20,763	865	88,376	4,356	152,945	115,597	3,226	11,771	107,052	19,368
Northwestern Pacific	376	154,813	134,196	311,051	57,705	39,564	2,866	107,182	8,630	215,947	95,104	.....	10,500	84,604	—10,517
Pittsburgh & Lake Erie	191	1,451,513	143,746	1,634,951	207,206	150,757	10,995	337,383	22,362	728,703	906,248	—247	25,200	880,801	—164,573
St. Louis, Iron Mtn. & Southern	3,316‖	1,782,380	538,084	2,517,451	391,652	330,728	57,766	800,530	77,498	1,658,174	859,277	—2,643	78,916	777,718	180,933
San Pedro, Los Angeles & Salt Lake	1,105	433,833	256,409	743,496	107,161	97,517	30,030	270,571	15,160	520,439	223,057	—4,353	26,606	192,098	13,001
Southern Pacific Co.	6,189a	5,410,041	2,700,194	8,655,866	970,587	1,080,415	155,567	2,214,063	221,987	4,642,619•	4,013,247	38,674	275,054	3,776,867	—588,217
Texas & New Orleans	458	228,166	97,247	346,612	65,809	58,864	6,507	141,654	9,220	282,054	64,558	610	12,182	52,986	—44,942
Trinity & Brazos Valley	458	235,575	39,019	280,035	38,549	33,653	8,764	97,710	12,973	191,649	88,386	.....	3,500	84,886	23,258
Wabash	2,514	1,950,331	702,386	2,848,208	280,103	395,686	75,094	1,013,861	79,876	1,844,620	1,003,588	—2,197	76,676	924,715	24,945
Western Maryland	543	532,372	92,613	651,865	84,824	88,047	8,310	217,210	12,237	410,628	241,237	504	19,500	222,241	—
Yazoo & Mississippi Valley	1,372	673,514	230,714	964,351	177,075	157,866	15,621	281,102	24,408	656,072	308,279	—182	33,000	275,097	32,657
FOUR MONTHS OF FISCAL YEAR 1911.															
Alabama & Vicksburg	143	$379,623	$171,143	$594,174	$75,445	$92,633	$15,464	$197,955	$21,445	$402,942	$191,232	$89	$17,560	$173,761	$34,761
Alabama Great Southern	309	991,009	401,542	1,516,885	186,362	338,175	41,003	449,967	35,259	1,050,766	466,119	—2,685	51,854	411,580	97,996
Ann Arbor	301	415,151	203,464	661,070	94,009	77,093	16,625	219,002	25,954	432,683	228,387	10,993	57,061	182,319	2,264
Baltimore & Ohio	4,434*	24,776,179	6,076,389	32,684,444	4,340,338	5,746,336	728,619	11,237,584	617,453	22,670,330	10,014,114	18,768	852,946	9,179,936	—594,737
Bessemer & Lake Erie	204	3,330,804	168,667	3,535,081	350,519	520,171	34,136	876,767	30,766	1,812,359	1,722,722	.....	27,000	1,695,722	—304,309
Chicago & Erie	269	1,359,201	306,389	1,803,544	232,298	376,794	81,902	741,632	37,839	1,470,465	333,079	.....	45,101	287,978	14,571
Cincinnati, New Orleans & Texas Pacific	337	2,460,416	578,975	3,192,827	328,069	533,193	80,526	835,470	70,857	1,848,115	1,344,712	—2,066	86,000	1,256,646	289,120
Colorado Midland	337	529,494	146,845	758,162	103,695	150,649	22,008	303,086	22,466	601,904	156,258	—440	34,000	121,818	—39,199
Detroit, Toledo & Ironton	441	614,568	68,260	735,518	125,045	131,941	11,993	344,556	22,051	635,586	99,932	—72	26,848	73,012	—867
Duluth & Iron Range	168	4,380,783	97,953	4,516,927	423,396	269,387	2,183	670,759	36,987	1,402,712	3,114,215	19,035	182,161	2,951,089	—900,984
Duluth, Missabe & Northern	293	6,665,541	168,515	6,865,482	419,287	434,925	6,843	838,555	46,720	1,746,330	5,119,152	53,772	277,407	4,895,517	—660,808
Duluth, South Shore & Atlantic	608†	773,006	393,808	1,227,668	169,172	120,996	43,075	416,304	32,198	781,745	445,923	8,190	72,000	382,114	19,356
Georgia	307	662,743	317,571	1,042,208	155,784	160,269	41,779	414,315	26,870	799,017	243,191	.....	8,733	234,458	—30,664
Georgia Southern & Florida	395	423,772	266,030	789,254	85,422	158,060	24,370	291,001	36,128	594,981	194,273	.....	37,128	157,145	—12,344
Grand Trunk Western	347‡	1,090,768	750,444	1,983,584	251,023	307,431	72,251	806,709	47,411	1,484,825	498,759	—4,468	126,789	367,502	—193,539
Hocking Valley	350	2,398,503	345,529	2,945,969	333,776	406,399	37,233	843,649	63,091	1,684,148	1,261,821	.....	119,960	1,141,861	61,686
Illinois Central	4,550	13,505,467	4,676,912	20,023,756	3,083,986	4,376,246	442,991	6,603,317	403,091	14,909,631	5,714,125	—27,097	811,639	4,875,389	1,440,859
International & Great Northern	1,159	2,382,505	734,232	3,319,837	485,166	451,219	75,702	1,204,208	84,772	2,301,067	1,018,770	—1,189	86,000	931,581	362,585
Iowa Central	558	917,350	219,251	1,188,486	154,881	221,369	29,967	459,138	36,229	901,584	286,902	.....	39,133	247,769	—39,585
Kanawha & Michigan	175	1,024,528	134,317	1,182,008	131,209	196,192	10,306	300,583	25,067	663,357	518,651	—39	32,236	486,377	187,982
Minneapolis & St. Louis	1,027	1,295,418	511,619	1,925,442	214,969	229,220	48,378	692,908	55,932	1,241,407	684,035	—116	81,291	602,628	—55,476
Minneapolis, St. Paul & S. S. Marie	3,572§	5,563,401	1,951,544	8,000,075	860,315	1,012,859	166,275	2,632,395	159,445	4,831,289	3,168,786	82,999	451,763	2,800,022	—1,066,070
Missouri Pacific	3,920¶	6,555,518	1,841,089	9,289,013	1,467,803	1,439,471	251,823	3,778,360	283,418	7,220,875	2,068,138	—8,378	334,000	1,725,760	—
Morgan's La. & Tex. R.R. & S.S. Co.	348	1,030,876	389,801	1,502,166	235,624	203,211	44,131	543,646	52,773	1,079,375	422,791	—7,476	71,024	344,291	—19,634
New Orleans & North Eastern	196	856,128	213,454	1,139,636	112,622	166,624	37,864	396,317	42,418	755,845	383,791	—251	33,000	350,540	26,242
New York, Susquehanna & Western	151	654,582	237,083	997,281	144,500	91,913	9,475	354,760	18,768	619,416	377,865	—11,388	46,630	319,847	43,835
Northwestern Pacific	376	582,569	713,384	1,384,972	200,846	160,507	11,601	434,875	35,731	843,560	541,412	.....	42,000	499,412	35,567
Pittsburgh & Lake Erie	191	5,517,572	622,887	6,305,259	746,825	547,667	55,837	1,343,475	94,238	2,788,042	3,517,217	—1,099	106,800	3,409,318	—307,103
St. Louis, Iron Mtn. & Southern	3,316‖	6,391,416	2,074,184	9,205,350	1,521,053	1,328,792	227,095	3,273,170	303,961	6,654,071	2,551,279	—10,589	313,664	2,227,026	—495,322
San Pedro, Los Angeles & Salt Lake	1,105	1,524,530	957,595	2,641,656	566,734	382,814	120,250	915,054	63,552	2,048,404	593,252	—16,775	100,716	475,761	—365,923
Southern Pacific Co.	6,189a	19,550,980	11,587,223	33,319,154	3,835,865	4,106,481	661,278	8,446,998	897,475	17,948,097	15,371,057	176,204	1,100,215	14,447,046	—1,153,431
Texas & New Orleans	458	845,148	358,280	1,279,748	228,019	213,633	27,344	473,658	36,941	979,595	300,153	1,844	48,728	253,269	—88,185
Trinity & Brazos Valley	458	518,219	141,581	679,751	137,139	135,768	31,922	315,230	39,334	659,393	20,358	.....	14,000	6,358	—22,318
Wabash	2,514	6,946,350	2,998,397	10,688,450	1,192,351	1,567,830	320,891	3,793,622	270,355	7,145,049	3,543,401	—1,259	297,002	3,245,140	12,883
Western Maryland	543	2,086,452	456,386	2,655,222	349,924	305,651	43,451	831,778	49,649	1,580,453	1,074,769	1,011	78,000	997,780	—
Yazoo & Mississippi Valley	1,372	2,109,701	832,518	3,145,587	789,928	590,532	60,194	1,038,004	89,350	2,568,009	577,578	—2,462	132,000	443,116	208,821

Mileage operated on October 31, 1909—* 4,460 miles; † 594 miles; ‡ 336 miles; § 3,425 miles; ¶ 3,883 miles; ‖ 2,610 miles; *a* 6,048 miles. —indicates Deficits, Losses and Decreases.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

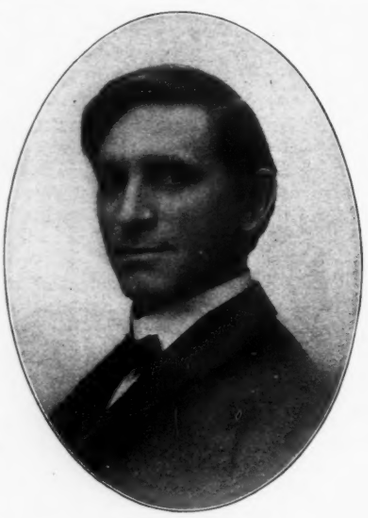
Executive, Financial and Legal Officers.

Charles E. Pugh, first vice-president of the Pennsylvania Railroad, at Philadelphia, Pa., will be retired on March 1, 1911, under the pension rules of the company.

A. M. Ardery, superintendent of the Virginia & Truckee at Carson City, Nev., has been appointed vice-president and general manager, with office at Carson City. E. B. Yerington, secretary and general freight and passenger agent, has been appointed secretary, with office at Carson City.

Cahrles H. Markham, president of the Gulf Refining Company, with office at Pittsburgh, Pa., and formerly vice-president and general manager of the Southern Pacific, has been elected president of the Illinois Central, succeeding J. T. Harahan, who retires under the pension system of the road on January 12.

Carl C. Wright, whose appointment as general solicitor of the Chicago & North Western, with office at Chicago, has been announced in these columns, was born April 19, 1859, at Whitehall, N. Y. He received his education at Tabor College, Tabor, Iowa; Colorado College, Colorado Springs, Colo.; and in the law department of the Iowa State University. From 1887 to 1892 he was in Wyoming and during this time was locally connected with the Chicago & North Western in that state. In the latter year he went to Omaha to engage in the general practice of law, and in 1903 was eletced city attorney of Omaha. Two years later he resigned that position to go with the Chicago & North Western as assistant attorney at Omaha, from which position he was promoted to general solicitor at Chicago.



C. C. Wright

Operating Officers.

J. F. Messmer has been appointed car accountant of the Peoria Terminal Railway, with office at Peoria, Ill.

W. S. Williams, trainmaster of the Illinois Central at Clinton, Ill., has been appointed superintendent, with office at Clinton, succeeding C. R. Westcott, resigned.

J. P. Atkins, car service agent of the Pere Marquette at Detroit, Mich., has been appointed chief supervisor of the Michigan Car Demurrage Supervising Bureau, with headquarters at Detroit.

W. A. Parker, chief engineer of the St. Joseph & Grand Island, at St. Joseph, Mo., has been appointed acting general manager, with office at St. Joseph, succeeding James Berlingett, resigned to go to another company.

G. W. Gillespie, chief train despatcher of the Grand Trunk, at Durand, Mich., has been appointed master of transportation, succeeding Richard Doyle, resigned. H. J. Tobin succeeds Mr. Gillespie, both with offices at Durand.

W. G. Koch, formerly superintendent of the Missouri, Kansas & Texas, of Texas, at Denison, Texas, has been appointed assistant superintendent of the St. Louis & San Francisco, on the line between St. Louis, Mo., and Newburg.

W. X. Garrison, trainmaster of the West Jersey & Seashore, at Camden, N. J., has been appointed passenger trainmaster, and D. A. Clapp, assistant trainmaster at Atlantic City, has been appointed freight trainmaster, both with offices at Camden.

C. P. Stembel, superintendent of the Eastern division of the Minneapolis & St. Louis at Minneapolis, Minn., has had his jurisdiction extended over the entire line. J. A. Swygart, superintendent of the Western division at Watertown, S. D., has resigned to engage in other business and that office is abolished.

C. A. Bray, chief despatcher on the St. Louis division of the Cleveland, Cincinnati, Chicago & St. Louis, has been appointed an assistant trainmaster, with office at Mattoon, Ill., his duties to be on the west end of the division. Horace Goodwin, despatcher at Terre Haute, Ind., has been appointed an assistant trainmaster, with jurisdiction over the east end of the division.

J. W. Coon, hitherto assistant to G. L. Potter, third vice-president of the Baltimore & Ohio, at Baltimore, Md., has been appointed assistant to A. W. Thompson, the new general manager, who succeeds Mr. Potter in the duties of general manager. R. N. Begien, assistant to chief engineer, at Baltimore, Md., has been appointed an assistant to the general manager, and his relationship to Mr. Thompson will be the same as when Mr. Thompson was chief engineer. A sketch of Mr. Begien's railway life was published in the *Railway Age Gazette* of May 13, 1910, page 1234.

E. H. Daniel, whose appointment as superintendent of the Central of Georgia, with office at Macon, Ga., has been announced in these columns, was born March 13, 1872, at Talbotton, Ga. He was educated at Le Vert college in his native town, and began railway work March 1, 1890, as a telegraph operator on the Central of Georgia, at Millen. He was later transferred to Savannah and then to Columbus. In October, 1895, he was appointed tarin despatcher, and five years later was appointed chief despatcher at Columbus, remaining in this position until May, 1905, when he was appointed trainmaster, which position he held at the time of his recent appointment as superintendent.

Traffic Officers.

William J. Bogert has been appointed general agent of the Illinois Southern, with office at Pittsburgh, Pa., a new agency.

Frank A. Hart has been appointed a general agent of the Chicago, Burlington & Quincy, with office at Clinton, Iowa, succeeding J. M. Rodman, deceased.

H. M. Guess has been appointed a contracting freight agent of the Indianapolis Southern, with office at Indianapolis, Ind., succeeding J. J. Clarke, resigned.

M. E. Malone, traveling passenger agent of the Canadian Pacific at Cincinnati, Ohio, has been appointed a traveling passenger agent, with office at Spokane, Wash.

T. G. Orr, traveling passenger agent of the Canadian Pacific at Pittsburgh, Pa., has resigned to become city ticket agent of the Buffalo, Rochester & Pittsburgh, with office at Pittsburgh.

Emile J. Herbert has been appointed first assistant general passenger agent, and F. O. Hopkins assistant general passenger agent of the Canadian Pacific, eastern lines, both with offices at Montreal, Que.

B. W. Herrman, agent of the Norfolk & Western at Columbus, Ohio, has been appointed general agent, with office at Cincinnati, Ohio, succeeding L. V. Finkle, deceased. G. C. Van Zandt, agent at Ironton, Ohio, succeeds Mr. Herrman.

C. B. Kealhofer has been appointed general freight agent of the Atlanta, Birmingham & Atlantic, with office at Atlanta, Ga., succeeding W. H. Quigg, resigned. As has been announced in these columns, J. R. Rowland has been appointed traffic manager, a new office.

C. B. Stout, freight solicitor of the Union Line of the Pennsylvania Lines West, in connection with the Indianapolis, Ind., agency, has been appointed freight solicitor of the Pittsburgh, Cincinnati, Chicago & St. Louis, with office at Louisville, Ky., succeeding J. T. Wray, promoted. Howard M. C. Sloan succeeds Mr. Stout.

W. A. Newman, assistant general freight agent of the New York Central & Hudson River in New York City, has been appointed general freight agent of the Lake Shore & Michigan Southern, the Dunkirk, Allegheny Valley & Pittsburgh and the Lake Erie, Alliance & Wheeling, with office at Cleveland, Ohio,

succeeding George B. Wheeler, resigned to engage in other business. T. J. Cook, general freight agent of the Chicago, Indiana & Southern at Chicago, has been appointed general freight agent of the Toledo & Ohio Central and the Zanesville & Western, with office at Toledo, Ohio, succeeding Hudson Fitch, assigned to other duties. Fred Zimmerman, general freight agent of the Indiana Harbor Belt, at Chicago, has been appointed also general freight agent of the Chicago, Indiana & Southern, succeeding Mr. Cook.

W. I. Jones, whose appointment as assistant general freight agent in charge of coal traffic of the Missouri Pacific, with office at St. Louis, Mo., has been announced in these columns, began railway work as a locomotive fireman on the St. Louis, Iron Mountain & Southern. He was later made weigh-master and freight inspector of the Western Railway Weighing Association and Inspection Bureau, and was afterward a bill clerk in the freight department of the Missouri Pacific at St. Louis. In 1890 he was made tariff clerk in the general freight office, where he remained for a year. He was then out of railway service until 1902, when he was made chief clerk to the assistant general freight agent. He was subsequently made commercial agent at Monroe, La., and for a year from November, 1907, was chief clerk in the general freight office at St. Louis. His next office was chief clerk to the freight traffic manager, which position he held until his recent promotion.

R. B. Miller, traffic manager of the Southern Pacific Lines in Oregon, the Oregon Railroad & Navigation Company, the Oregon & Washington and the Ilwaco Railroad, and general freight agent of the Corvallis & Eastern, with office at Portland, Ore., has been appointed traffic manager of the Oregon-Washington Railroad & Navigation Company (See editorial note in the *Railway Age Gazette*, December 2, page 1033), with jurisdiction over the lines south of the Columbia river and east of the Cascade mountains, including the line between Megler, Wash., and Nashcotta, with office at Portland. F. W. Robinson, general freight agent of the Oregon & Washington and the Oregon Railroad & Navigation Company; H. E. Lounsbury, assistant general freight agent of the Oregon Railroad & Navigation Company; Wm. McMurray, general passenger agent of the above companies, and J. M. Scott, assistant general passenger agent, have all been appointed to similar positions on the Oregon-Washington Railroad & Navigation Company. W. D. Skinner, general freight and passenger agent of the Oregon & Washington at Seattle, Wash., has been appointed general freight and passenger agent of the lines west of the Cascade mountains, including the line from Portland, Ore., to Vancouver, Wash., with office at Seattle.

Engineering and Rolling Stock Officers.

Curtis Dougherty, who was recently promoted from engineer maintenance of way to chief engineer of the Cincinnait, New Orleans & Texas Pacific and the Alabama Great Southern, with office at Cincinnati, Ohio, as has been announced in these columns, was born July 30, 1863, in Jersey county, Illinois. He graduated as a civil engineer from Washington University at St. Louis in 1885, and began railway work in the following year with the Wisconsin Central. For four years from 1888 he was an engineer on the Chicago & Western Indiana; he then went with the Illinois Central, first as roadmaster, and later as superintendent, remaining with that road until 1907. His next position was assistant chief engineer of the Cincinnati, New Orleans & Texas Pacific and the Alabama Great Southern. In 1908 he was promoted to contracting and consulting engineer, and in 1909 engineer maintenance of way, from which position he was promoted to chief engineer as above on November 1, 1910.

C. Dougherty

M. Jungling has been appointed master mechanic of the New Orleans Great Northern, with office at Bogalusa, La.

E. F. Hewitt, engine house foreman of the Pennsylvania Railroad, at Meadows, N. J., has been appointed general foreman of the Meadows shops. F. A. Lammerding succeeds Mr. Hewitt.

G. C. Bonefeld has been appointed master mechanic of the United Railways of Havana, with office at Havana, Cuba, succeeding William M. Stokes, resigned to go to the Galena Oil Co. at Buenos Ayres, South America.

J. C. Garden, master mechanic of the Eastern division of the Grand Trunk, at Montreal, Que., has been appointed master mechanic of the Battle Creek (Mich.) shops, succeeding J. T. McGrath, resigned. J. Duguid succeeds Mr. Garden.

A. F. Blaess, roadmaster of the Illinois Central at Louisville, Ky., has been appointed assistant engineer maintenance of way, with office at Chicago, succeeding L. A. Downs, whose appointment as superintendent at Fort Dodge, Iowa, has been announced in these columns.

Special Officers.

John S. Dennis, assistant to vice-president of the Canadian Pacific, has been appointed manager of the company's irrigation and land interests in Alberta and British Columbia, and will also perform such other duties as may be assigned to him by the president, with office at Calgary, Alb.

OBITUARY.

Theodore E. Eisman, chief of tariff bureau of the Michigan Central, died December 18, at his home in Detroit, Mich., at the age of 40 years.

Major John Fletcher Hanson, president of the Central of Georgia Railway and the Ocean Steamship Company of Savannah, died December 15 at Atlanta, Ga. Major Hanson was born November 25, 1840, in Monroe county, Ga. He was educated in the public schools and for a time worked on a farm. During the civil war he served in the Confederate army and was prominent in carrying out the reconstruction work in Georgia following the war. He was first a cotton merchant at Macon, and later became a cotton manufacturer. His first connection with a railway was in 1894, when he was made a director of the Georgia, Southern & Florida; he was later made a director of the Central of Georgia. From April, 1900, to December, 1903, he was chairman of the board of directors of that company. He was elected president of the same company in December, 1903, and since June, 1902, had been president of the Ocean Steamship Company. Major Hanson was always frank and straightforward in his speech and dealings with men and affairs. He never shrank from a duty or dodged an issue. His convictions were always clear and he had the courage to stand by them and defend them. Without means or influential friends he impressed on men and affairs his strong personality and ability, winning recognition in that way, and at the time he was elected to the presidency of the Central of Georgia he was practically without railway experience, except that gained as a director of the road and for a short time as its chairman. Under his management the railway and the steamship company prospered and developed. He was a member of the first Pan-American Congress in 1889 and was a member of the United States Monetary Committee. At the time of his death he was a member of the Union League Club of New York, and the Piedmont Driving Club and the Capital City Club of Atlanta.

The Bagdad railway, a continuation of the Anatolian line from Constantinople to Konia, and completed from Konia to Bulgurlu in Asia Minor, is being extended 520 miles via Adana and Aleppo, Syria, with Bagdad as its goal. The entire construction will take about four more years. The work is being done by a German engineering company, incorporated in Switzerland for the purpose (Die Gesellschaft fuer den Bau der Eisenbahnen in der Turkei). The material employed is almost entirely of German manufacture, and includes the latest German steel rails and steel ties. It has been decided that Mersine will be the port to and from which the new sections of the Bagdad railway will run. Harbor works will have to be erected by the railway company and surveys of the port are being made.

Railway Construction.

Algoma Central & Hudson Bay.—Bids are wanted by R. S. McCormick, chief engineer of the Manitoulin & North Shore, Sault Ste. Marie, Ont., up to January 2, 1911, for the construction of the roadbed and structures on the M. & N. S., as follows: Crean Hill, at Mile 22.7 west of Sudbury, Ont., to a connection with the present line at Espanola; Espanola, south to a point at or near Mile 61.

Angelina & Neches River.—This road is now in operation for freight and passenger traffic from Keltys, Tex., east to Naclina, 19.9 miles.

Atchison, Topeka & Santa Fe.—Surveys have been made for a line through the Palo Verde Valley, Cal., via the towns of Blythe, Neighbors, Palo Verde and Rannells.

Double-tracking work was completed early in December between Daggett, Cal., and Cottonwood, 25 miles, and the line is now in operation. The Sharp & Fellows Construction Company were the contractors.

Big Sandy & Cumberland.—This road has been extended from Blackey, Va., to Matney.

Canadian Northern.—The Rossburn subdivision has been extended from Russell, Man., west to Caldor, 40.80 miles; the Shelbrooke subdivision has been opened for business from Prince Albert, Sask., west to Shelbrooke, 28.5 miles; the St. Rose subdivision has been opened for business from Ochre river, Man., to St. Rose, 11.30 miles. The company now has work under way on 76 miles in Manitoba; 283 miles in Saskatchewan, and 221 miles in Alberta. The Cowan Construction Company, the Northern Construction Company, Ltd., Winnipeg, and McMillan Brothers & Kenny, are the contractors.

Canadian Pacific.—Work is now under way on extensions as follows: Tillston, Man., west to a point in Saskatchewan, 25.71 miles; in Saskatchewan, between Colonsay and Regina, 58 miles; from Bulyea, south 6.9 miles; Estevan, west 20 miles. In Alberta from Irricana, east 36.9 miles, and from Carmangay, north 56 miles. In British Columbia the Wardner-Fort Steel line is being extended 24.9 miles, also the Port Moody spur, 3.5 miles, and the Wellington Camp branch, 3.3 miles. The grading work has been finished but track laying has not yet been started.

The Esquimalt & Nanaimo has been extended from Wellington, B. C., north to Cameron Lake, 30 miles.

Central Arkansas & Eastern.—An officer writes that work is under way by Thompson & Scott, St. Louis, Mo., from McGregor, Ark., east to Stuttgart, 18 miles, and from Junction, north to Hazen, 17 miles. C. D. Purdon, chief engineer, 1342 Pierce building, St. Louis. (June 24, p. 1812.)

Charlotte Harbor & Northern.—This company is building with its own men from Pierce, Fla., to Mulberry, three miles. (August 5, p. 262.)

Chattanooga Southern.—A new company, to be known as the Tennessee, Alabama & Georgia, is to be formed to take over the rights and property of this company, including the 27 miles of new track from Rome, Ga., to Rockmart, where connection is to be made with the Seaboard Air Line. Eight miles additional are to be built to connect with the Rome & Northern. This new construction will give the Chattanooga Southern, via the Seaboard Air Line from Rockmart, a through line from Chattanooga, Tenn., to Atlanta, Ga. (September 2, p. 1439.)

Chicago, Milwaukee & Puget Sound.—The Cannon Ball Line is now open for passenger and freight traffic from McLaughlin, S. D., northwest to Mott, N. D., 104 miles, and Eagle Butte extension is open for business from Cheyenne Junction, S. D., to Eagle Butte, 63.1 miles.

Chicago & North Western.—A new branch of the Sioux City division has been opened for business from Sioux City, Iowa, north via Merrill, and Craig to Hawarden, 43 miles.

Detroit, Bay City & Western.—This road has been opened for freight traffic from Bay City, Mich., southeast to Caro, 28 miles. It is expected that the line will be opened for passenger service about January 1, 1911.

Detroit & Mackinac.—An officer writes that surveys are being made from Posen, Mich., to Rogers City, 13 miles.

Duluth, Winnipeg & Pacific.—Work is now under way by Foley, Welch & Stewart, St. Paul, Minn., on an extension from Pale Face river, Minn., to Duluth, 50.40 miles. The Wisconsin Bridge & Iron Company, Milwaukee, Wis., has contracts for all the steel bridges on the line.

Enid, Ochiltree & Western.—An officer writes that surveys are under way to Ochiltree, Tex., 113 miles from Dalhart. The company is carrying out the construction work with its own men. During the year track was laid on the section from Dalhart to Wilko, 11.8 miles. A. E. Weist, Jr., vice-president and general manager, Dalhart.

Esquimalt & Nanaimo.—See Canadian Pacific.

Gulf Coast & Provident City.—This company is building from Provident City, Tex., to Glenflora, 31 miles. J. A. Edmondson is doing the grading work, and John Greig the clearing and grubbing. J. G. Reaves, vice-president and general manager, Provident City. (September 23, p. 558.)

Kansas City & Memphis.—Incorporated in Arkansas with $6,000,000 capital, to build from Rogers, Benton county, Ark., to Memphis, Tenn., with branches to a point in Faulkner, Ark., and to Little Rock; also, from Rogers to Siloam Springs and Eureka Springs, with Wagoner, Okla., as the ultimate destination. The plans call for building about 350 miles of line, on which work is to be started at once. The names of the incorporators are not given.

Lexington & Eastern.—See Louisville & Nashville.

Louisville & Nashville.—An officer writes that work is under way by the Callahan Construction Company, Knoxville, Tex., on an extension from Baxter, Ky., to Wisconsin, 26 miles, and between Pongo and Amon, two miles, as well as on the Torres creek spur, an additional two miles.

The Lexington & Eastern has been extended from Jackson, Ky., to Dumont, two miles, and a new branch has been opened for freight traffic from Jackson to Quicksand, three miles.

Louisiana & Northwest.—An officer writes that the company is relocating 1.5 miles of main line into Natchitoches, La., and that new terminals and a station are being put up at Natchitoches.

Lida Valley Railroad.—Financial arrangements have been made, it is said, to build from Stonewall, Nev., on the Las Vegas & Tonopah, to Lida, about 25 miles, with a one-mile branch to Hornsilver. A. D. Goodenow, general manager.

Maine Central.—Work has been finished by this company on the elimination of the Raines Hill crossing in Augusta, Me. The Fletcher-Lahey Company, Boston, Mass., were the contractors. (April 22, p. 1065.)

Manitoulin & North Shore.—See Algoma Central & Hudson Bay.

McCrory & Beedeville Southern.—Work is now under way from McCrory, Ark., to Beedeville, Okla., 14 miles. Clayton Hailey, president, and G. G. McCrory, chief engineer, McCrory. (June 24, p. 1812.)

Mexico North Western.—Work is now under way by R. M. Dudley, general contractor, Madera, Chihuahua, Mex., on a 41-mile section of the line which is to connect Terrazas with Madera.

Mexican Railway.—A concession has been granted by the state of Guerrero, Mex., to F. E. Olendorf, Taxco, Guerrero, to build from Naranjo to Taxco, 19 miles, through a mining section. This is to be a narrow gage line, and it is expected that the work will be finished within a few months.

Missouri, Oklahoma & Gulf.—An officer writes that surveys have been finished and location is made for lines as follows: Spur line to Bromide, Okla., three miles; Coalton, Okla., to Okmulgee, 13 miles, and from Wagoner to Pittsburg, Kan., 125 miles.

Motor Grand Traction.—An officer writes that the company expects to let contracts next spring for a line from Salina, Kan., south via Gypsum City, Roxbury, Canton and Newton to Wichita. M. M. Bremen, president, Roxbury.

Muscatine North & South.—This road has been extended from Elrick Junction, Iowa, south to Kingston, 13 miles.

NEW YORK CENTRAL & HUDSON RIVER.—The Clearfield Southern branch of the Pennsylvania division has been extended from Boardman, Pa., to Carnwath, three miles.

NEW YORK, PHILADELPHIA & NORFOLK.—The Cape Charles Railroad has been opened for business from Cape Charles, Va., to Townsend, nine miles.

NORFOLK & WESTERN.—An officer writes that work is now under way on the Petersburg Belt Line, and connections from Poe, Va., to Addison, 10.60 miles; also on the Dry Fork branch and connections from Canebrake, W. Va., to Cedar Bluff, Va., 14.70 miles, and on the North Fork branch from Jeanette, W. Va., on 4.31 miles.

NORTH YAKIMA & VALLEY.—Grading work has been finished from Granger, Wash., to Parker, on 17.2 miles, and track laying will be carried out by the company's men.

OKLAHOMA, KANSAS & MISSOURI INTERURBAN.—This company expects to build an extension from Huttonville, Okla., via Baxter Springs, Kan., to Galena, 30 miles. A line is also to be built from Riverton, Kan., to Columbus, nine miles. The company has finished work from Miami, Okla., to Huttonville, five miles.

PACIFIC RAILWAY & NAVIGATION COMPANY.—Work is now under way from the present end of track to Wheeler, Ore., 31 miles. The J. W. Sweney Construction Company, Portland, are the contractors. The line has been located on the section from Timber to Astoria, 82.28 miles.

RICHMOND & CHESAPEAKE BAY.—An officer writes that during the spring of 1911 a line is to be built from Ashland, Va., north to Doswell, seven miles.

ROARING FORK.—Work is under way by Bunn & Co., Big Stone Gap, Va., from Roarking Fork to Big Black mountain, five miles.

ROCKPORT & ARANSAS PASS, INTERURBAN.—Incorporated in Texas with $10,000 capital and headquarters at Rockport, Tex. The plans call for a line between Rockport and Aransas Pass. The incorporators include: C. F. Hoff, S. A. Clevenger, C. G. Johnson and W. H. Vernor.

SAN PEDRO, LOS ANGELES & SALT LAKE.—An officer writes that work is under way by the Utah Construction Company and the Shattuck-Edinger Company on the line to take the place of the old line between Guelph, Nev., and Caliente, 62 miles.

SOUTHERN PACIFIC.—The report of this company for the year ended June 30, 1910, shows that the additions and changes on line owned or operated made during the year included the following: Central Pacific—Change in line, Deeth, Nev., to Wells, 16.38 miles; Elmhurst, Cal., to Stonehurst, 0.75 miles; the Inter-California was completed from Tecolote, Mex., to Hanlon Junction, Cal., 21.71 miles; the Nevada & California was finished from Mabel to Haiwee, 12.58 miles, and from Haiwee to Olancha, 9.2 miles; the Southern Pacific added 6.23 miles of line, due to change of trackage rights over the Northwestern Pacific; the Tucson & Nogales, from Tucson, Ariz., to Sahuarita, 17.76 miles, was bought from the Twin Buttes Railroad, and a new line built from Sahuarita to Calabasas, 37.69 miles, has been opened for traffic. In addition, the company has construction work under way on lines as follows:

	Length of Projected Line. Miles.	Track Completed. Miles.	Grading Completed. Miles.	Grading Progressing. Miles.
Arizona Eastern Railroad:				
Phoenix, Ariz., to Hassayampa	39.22	19.91	1.59	12.80
Winkelman to San Carlos	32.79	.94	6.23	
Beaverton & Willsburg Railroad:				
Beaverton, Ore., to Willsburg	10.55	10.50	.05	
California Northeastern Railway:				
Weed, Cal., to Klamath Falls, Ore	88.72	88.72		
Central California Railway:				
Niles, Cal., to Redwood City	16.24	15.52	.72	
Louisiana Western Railroad:				
Eunice, La., to Mamou	10.76	9.50		
Morgan's Louisiana & Texas R. R. & S. S. Co.:				
Lafayette, La., to Port Allen	52.57	49.12	2.50	
Nevada & California Railway:				
Olancha, Cal., to Owenyo	29.50	—	29.50	
Oregon Eastern Railway:				
Natron, Ore., to Klamath Falls	193.80	—	17.13	15.85
Oregon Western Railway:				
Drain, Ore., to Marshfield	73.12	—	—	3.24
Pacific Railway & Navigation Company:				
Hillsboro, Ore., to Tillamook	91.00	59.00		
Sacramento Southern Railroad:				
Sacramento, Cal., to Walnut Grove	23.90	10.12	7.80	2.65

Under the concession granted for the construction of the Southern Pacific Railroad of Mexico, there was completed during the year 115.84 miles, making a total of 899.69 miles, completed to June 30, 1910. The mileage projected under the concession is shown below:

	Projected. Miles.	Constructed to June 30, 1910. Miles.	Remaining to be Built. Under Construction. Miles.	Remaining to be Built. To be Built. Miles.
Main Line — Empalme, Mex., to Guadalajara	840.64	669.87	11.78	158.99
Branch Lines	652.51	229.82	—	422.69
Total	1,493.15	899.69	11.78	581.68

Since the close of the fiscal year the Southern Pacific of Mexico has been granted a concession to build from Guadalajara to Mexico City, passing through Zamora and Morelia, changes were also made in all the concessions held by this company in the states of Sonora and Sinaloa. The company is given until November 6, 1915, to complete the line it is now building to Guadalajara and which is at present completed to the Santiago river. It must also designate before that date what branch lines, not to exceed 93 miles in length, it wishes to construct between Navajoa and Guadalajara. The company formerly held various concessions to build the following lines: (1) From Tonichi, Sonora, to a point on the northern boundary between San Bernardino and Agua Prieta; (2) from the confluence of the Yaqui and Moctezuma rivers in Sonora, passing through Moctezuma and Cumpas to Nacozari, Sonora; (3) a branch from line No. 1 to La Barranca, Sonora; (4) a line from Empalme to Guaymas, Sonora; (5) the part of the line which is still lacking between Empalme and Morrito; (6) a line from Lomas to Nogales, Sonora; (7) the part of the line which is to be constructed in order to reach the port of Mazatlan connecting with the main line between Culiacan and Mazatlan, Sinaloa. Under the new concession the company must construct at least 31 miles each year on some of the seven lines, must have 186 miles completed in five years, and all of them must be entirely completed in ten years. The company will have the right to import free of duty for five years, for the exclusive use of the line between Alamos and Guadalajara, machinery for workshops, artisans' tools, lubricating oil, and powder. (See report of this company elsewhere in these columns.)

According to press reports, a line is to be built from Redmond, Ore., at the southern terminus of the Des Chutes Railroad, to Odell, on the Klamath-Natron cut-off, and a line will probably be built from Grants Pass to a point on the northern coast of California at Crescent City. The company also has under consideration the question of constructing a line to Coos Bay.

ST. LOUIS, BROWNSVILLE & MEXICO.—Work is now under way on a branch from Brownsville, Tex., to Brulay plantation, 10 miles.

ST. LOUIS & ST. LIBORY.—This company has projected a line from St. Louis, Mo., southeast to Nashville, Ill., 52 miles. D. O. Thomas, secretary and general manager, Belleville, Ill

TENNESSEE, ALABAMA & GEORGIA.—See Chattanooga Southern.

TEXAS SOUTHEASTERN.—This road, which is owned by the Southern Pine Lumber Company, according to press reports, will be extended from Lufkin, Tex., to Dallas, about 130 miles, if financial aid is given by towns along the proposed route.

WASIOTO & BLACK MOUNTAIN.—See Louisville and Nashville.

WESTERN OF GEORGIA.—Surveys have been made from Aberdeen, Ga., to Franklin, 37 miles. I. L. McCord, New York, is the contractor. J. N. Orr, president, Noonan, Ga.

WHITE SULPHUR SPRINGS & YELLOWSTONE PARK.—This road has been opened for business from Ringling, Mont., to White Sulphur Springs, 23 miles.

The plans submitted by the Sao-Paulo-Rio Grande for building a line to connect the Parana Railway with the Sao Francisco line at Rio Negro, have been approved by the Brazilian government. The cost of building the line is estimated at about $157,500.

Railway Financial News.

Alabama Great Southern.—A dividend of 2½ per cent. has been declared on the common stock, payable December 30. In June, 1909, and in June, 1910, 2 per cent. was declared on the common stock. Previous to 1909 no dividends were paid on the common stock.

Algoma Central & Hudson Bay.—The Banque Franco-Americaine is offering in Paris, France, $3,000,000 new first mortgage 5 per cent. bonds of the Algoma Central & Hudson Bay at 463.50 francs per 515 franc bond.

Central of New Jersey.—Besides the regular quarterly dividend of 2 per cent., an extra dividend of 2 per cent. has been declared payable out of the earnings of the Lehigh & Wilkesbarre Coal Co. There have been two previous 2 per cent. extra dividends from earnings of the coal company, one paid December 15, 1909, and the other June 25, 1910. Howard W. Maxwell has been elected a director, succeeding J. Rogers Maxwell.

Chattanooga Southern.—*The Commercial & Financial Chronicle* says that it is proposed to form a new company called the Tennessee, Alabama & Georgia, which is to take over the Chattanooga Southern and is to issue bonds to pay for the proposed extension from Rome, Ga., to Rockmart, 27 miles. See this company also under Railway Construction.

Chesapeake & Ohio.—The syndicate headed by Kuhn, Loeb & Co., New York, which last March underwrote the $31,930,000 20-year 4½ per cent. convertible bonds issued in connection with the purchase of the Hocking Valley and for other purposes, has been dissolved, the bonds having all been sold.

Chesapeake & Ohio.—See Kanawha Bridge & Terminal.

Cincinnati, Bluffton & Chicago.—The circuit court has ordered the sale of this property on March 15, 1911, fixing the upset price at $800,000.

Cumberland Railway & Coal.—The Dominion Steel Corporation confirms the report that this company, or its directors, have bought a controlling interest in the stock of the Cumberland Railway & Coal Company. The Cumberland Railway & Coal Company owns coal mines at Spring Hill, Nova Scotia, and operates a railway running from Spring Hill Junction, on the Intercolonial to Parrsboro, on the Bay of Fundy.

Delaware, Lackawanna & Western.—The New Jersey Railroad Commission has given permission to the Newark & Bloomfield, which is leased to the Delaware, Lackawanna & Western, to issue $1,496,150 additional stock for cash at par.

Interborough Rapid Transit.—The new plan of financing has been completed, and is ready for submission to the New York Public Service Commission. This plan will call for $150,000,000 of new capital. The entire amount will be secured by a first mortgage on the Interborough's present and future property, as the plan calls for the retirement of the outstanding bonds under the existing $55,000 first mortgage, which are callable in blocks not less than $1,000,000 at 105 and interest on any interest date.

Proceeds of the $150,000,000 bond issue will, according to the draft now prepared, be used for the following purposes:

Addition subway	$75,000,000
Elevated extensions	32,000,000
Retirement of outstanding 1st mortgage bonds	35,000,000
Redemption of I. R. T. notes	4,584,000
Total	$146,584,000

Interstate Railroad.—This company has increased its capital stock from $1,000,000 to $1,500,000. The road runs from Norton, Va., to Stonega, 16 miles.

Kanawha Bridge & Terminal.—The Chesapeake & Ohio has bought the entire capital stock of this company, which owns the bridge across the Great Kanawha river near Charleston, W. Va. The bridge gives the C. & O. its entrance into Charleston and connects it with the Kanawha & Michigan.

Minneapolis & St. Louis.—Of the $5,000,000 5 per cent. notes due February 1, 1911, $1,000,000 are to be paid off, and holders of the remaining $4,000,000 are offered the privilege of having their notes extended at 5 per cent. to February 1, 1913. The $4,000,000 notes will be secured by the same collateral now securing the $5,000,000 notes.

Newark & Bloomfield.—See Delaware, Lackawanna & Western.

Philadelphia & Reading.—The New York Stock Exchange has listed $4,110,000 additional general mortgage 4 per cent. bonds of 1887-1997. Of these bonds, $1,500,000 are to pay for new acquisitions and betterments, and the remaining bonds are to be used for refunding purposes.

Tennessee, Alabama & Georgia.—See Chattanooga Southern.

Tonopah & Tidewater.—A press despatch form Tonopah, Nev., says that the Tonopah & Tidewater is to lease the Tonopah & Goldfield, thereby gaining a connection with the Southern Pacific.

Tonopah & Goldfield.—See Tonopah & Tidewater.

Wabash-Pittsburgh Terminal.—The receivers of the Wabash-Pittsburgh Terminal and the West Side Belt have been given permission by the United States circuit court to issue $2,000,000 receivers' certificates to buy 2,000 freight cars for the West Side Belt. The trustee of the bondholders and bondholders' protective committee approved the application and the Wabash Railroad objected.

In the suit brought by the Colonial Trust Company (Chapin committee interests), Pittsburgh, to compel the Wallace protective committee to return bonds deposited with it pending an adoption of a reorganization plan, Judge Noyes, in the United States circuit court, has decided in favor of the Colonial Trust Company. The court holds that the agreement under which bonds are deposited with the Wallace committee permits of owners withdrawing their bonds if they are dissatisfied with the work being done by the protective committee. The time for depositing bonds under the plan of the Chapin committee (Colonial Trust interests) has been extended to January 16, 1911.

FOREIGN RAILWAY NOTES.

A concession has been granted to the Société de Developpement de St. Moritz, of Switzerland, for building and operating an electric fumicular railway from St. Moritz to l'Alpe Giop.

German freight traffic shows a steady increase from one quarter to another. As compared with the corresponding quarters of last year, freight receipts during the first quarter show an increase of 5.3 per cent. and for the third quarter 7.4 per cent. The increase in passenger receipts is not as regular, for while the first quarter of this year shows an increase of 17.4 per cent. over the same period last year, the increase during the second quarter was only 3.6 per cent. Quarterly returns for passenger traffic tend to show such differences, however, according to the number of Sundays that happen to fall in the respective quarters. German lines total 37,244 miles, or 567 more than a year ago. Thereceipts of the principal government lines are shown in the detail as follows for the month of September, 1910. It should be noted that the Bavarian lines are included:

Line.	Total receipts, September, 1910.	Increase over September, 1909.
Prussian and Hessian	$42,042.224	$3,095.428
Bavarian	6,202,814	669,864
Saxony	3,529,350	179,214
Wurttemberg	1,649,340	82,348
Baden	2,077,733	88,146
Alsace-Lorraine	2,420,698	128,282

The Prussian and Hessian lines, managed by the Prussian railway department, have 6,903 stations and 593 workshops. Of these workshops, 70 employ more than 300 persons. Some 3,000 apprentices are trained in 66 workshops. In connection with the Prussian and Hessian lines, the government owns and operates 99 gas works, which produce annually 776,886,000 cu. ft. of gas, and 142 electrical works.

Supply Trade Section.

Charles E. Pollard, designing and selling engineer of the E. W. Bliss Company, Brooklyn, N. Y., died suddenly at his home of apoplexy December 16.

J. G. Bower has been appointed assistant manager of sales for the Western district of the Pressed Steel Car Company, Pittsburgh, Pa., and the Western Steel Car & Foundry Company, with office in the Old Colony building, Chicago, effective January 1, 1911.

The Kennicott Co., Chicago Heights, Ill., has leased one-half of the 14th floor of the Corn Exchange Bank building, Chicago, to be occupied by its sales office exclusively. The company is engaging in new lines and increases in its previous lines are responsible for this step.

Cass L. Kennicott, vice-president and general manager of the Kennicott Co., Chicago Heights, Ill., will deliver an address before the engineering students of the University of Illinois early in February on The Application of Water Softening to Economical Locomotive Operation.

The Jeffrey Manufacturing Company, Columbus, Ohio, has opened a new office in the Fourth National Bank building, Atlanta, Ga., with D. C. Rose, formerly with the Dodge Manufacturing Company, New York, as manager. A stock of Jeffrey chains and catalogs will be on hand.

The Detroit River Tunnel Company has installed a 25-ton Northern crane, made by the Northern Engineering Works, Detroit, Mich., in its machine department and another of the same make in its power station. Several similar cranes were also installed by the Northern Engineering Works in the Pennsylvania Railroad terminal buildings in New York.

John H. Barker, president of the Haskell & Barker Car Company, died at his home in Michigan City, Ind., on December 4 of double pneumonia. W. J. McBride, vice-president and general manager of the Haskell & Barker Car Company, has been elected president, succeeding John H. Barker. Charles Porter, secretary of the company, has been appointed treasurer and Louis Boisot, secretary.

The Empire Steel & Iron Company, Catasauqua, Pa., has declared a semi-annual dividend of 2 per cent. on its preferred stock—a reduction of 1 per cent., semi-annually. According to a statement of the company, the earnings for the entire year were more than sufficient to pay the full dividend of 6 per cent. on the preferred stock, but owing to the depressed condition of the iron business and the uncertain outlook for the near future it was thought wise to curtail.

The stockholders of the Union Switch & Signal Company, Swissvale, Pa., at the annual meeting in Pittsburgh, Pa., authorized increasing the capital stock from $2,500,000 to $5,000,000. A quarterly dividend of 3 per cent. on common and preferred stocks has been declared, payable January 10. Besides, a 60-per cent. stock dividend, payable in equal amounts of common and preferred stock, is announced. It was also announced that stockholders of record on December 31 will have the right to purchase, pro rata, 10,000 shares of new stock at $75 per share. The par value of the stock is $50. The remaining 10,000 shares of the new stock will be held in the treasury against future needs. George Westinghouse, president of the company, said that the year now closing would show the greatest volume of business ever done in the history of the company.

TRADE PUBLICATIONS.

Illinois Central.—This company has issued an illustrated folder on the Choice of Routes to Cuba. Time tables, dates of sailings and information about Cuba are included.

Nut Burring Machine.—The National Machinery Company, Tiffin, Ohio, has devoted a two page leaflet to the advantages and illustrations of the national semi-automatic nut burring machine.

Illinois Central.—This company gives some interesting information on the attractions of Panama, Costa Rica and Guatemala in a 60-page illustrated booklet. Steamers sail weekly from New Orleans.

Southern Pacific.—This company has published a 30-page pamphlet on the attractions of The Dalles, Ore., showing the growth of this town and the agricultural possibilities of the surrounding country.

Belted Corliss Engines.—Allis-Chalmers Co., Milwaukee, Wis., has issued a reprint, bulletin No. 1501, on belted Corliss engines, giving full description of the Reliance pattern of Corliss engines built by that company.

Northern Pacific.—In a 50-page illustrated booklet called Eastern Washington and Northern Idaho, the Northern Pacific gives detailed information as to population, progress and agricultural resources in that region.

Core Drills.—The Ingersoll-Rand Company, New York, in its illustrated catalogue No. 9001, considers the advantages of Calyx diamondless core drills. These drills are used mainly for mineral prospecting, well digging and soundings.

Air Compressors.—The Chicago Pneumatic Tool Company, Chicago, has published a 100-page catalogue of Franklin air compressors. Diagrams, illustrations, tables and other data give full information about the various types and the methods of installation.

Electric Railways.—Bulletin No. 4794, of the General Electric Co., Schenectady, N. Y., describes the 1,200-volt direct-current interurban lines of the Milwaukee Electric Railway & Light Co. This is a reprint of an article which appears in the *Electric Railway Journal.*

Steam Pumps.—Dean Bros., Indianapolis, Ind., have issued catalogue No. 83 on the Atlantic type steam pumps, boiler feeders and pressure pumps manufactured by that company. The catalogue gives many illustrations and full details concerning these pumps.

Switchboard Meters.—The General Electric Company, Schenectady, N. Y., has devoted its bulletin No. 4662A to Thomson watt-hour meters for switchboard service. The various features of these meters are pointed out in detail, and diagrams, illustrations and tables are included.

Great Northern.—The passenger department of the Great Northern has issued two publications, describing the opportunities in cheap land in the states of Oregon and Minnesota. The homestead laws are fully explained and photographs and descriptive matter concerning the agricultural possibilities of that country are included.

Four-Cylinder Balanced Simple Locomotive.—The American Locomotive Company, New York, has issued Bulletin 1007, relating to the four-cylinder balanced simple Atlantic type locomotive built for the Rock Island, which has now been in service one year. The bulletin is illustrated with drawings showing the general plan and details of the cylinders and valves. The principal item of interest is the report of results of tests made with the engine in fast passenger service between Chicago & Rock Island, as compared with the performance of a two-cylinder simple Atlantic and a four-cylinder balanced compound, the three engines being nearly equal in weight, size of boiler and cylinder capacity.

Mallet Articulated Locomotives.—Record No. 68 of the Baldwin Locomotive Works, Philadelphia, Pa., relates to Mallet articulated locomotives. It describes successive improvements made in this type of engine since it was introduced on American railways in 1904. Among these are: First, the separable boiler with the evaporating portion in the rear section and the feedwater heater in the front section, the separable joint surrounding an intermediate combustion chamber. Second, a frame connection employing a single radius bar; with this form of con-

nection the frames can move vertically with reference to each other without binding at the joint. Third, an improved form of front frame construction, made so the transverse distance between the cylinders can be kept within reasonable limits regardless of distance between frame centers. Fourth, the pneumatic reversing gear connected with the reverse shafts of both high and low pressure cylinders. The record includes illustrations and data relating to 13 different locomotives of various sizes and wheel arrangements. The form of the record has been changed so as to make it more convenient for reference. The half-tone illustration and description are on the left-hand page and the outline drawing, with general dimensions, weights, etc., on the right-hand page. Among the larger locomotives thus illustrated are those having six drivers in each unit, as supplied to the Southern Pacific and the Chicago, Burlington & Quincy; those having six drivers in the front unit and eight in the rear unit, as supplied to the Great Northern; and those having eight drivers in each unit, as supplied to the Norfolk & Wetsern, the Southern Pacific and the Atchison, Topeka & Santa Fe.

RAILWAY STRUCTURES.

Auburn, Wash.—The Northern Pacific will build a roundhouse and repair shop and about 50 miles of yard track.

Barstow, Cal.—The Atchison, Topeka & Santa Fe expects to open for business the new passenger station at Barstow. The cost of the improvement was $250,000. (February 11, p. 332.)

Cincinnati, Ohio.—The Cincinnati Union Depot & Terminal Company has accepted the city's ordinance for a new union passenger station previously mentioned in the *Railway Age Gazette*. The building is to be 200 x 400 ft.. located at the corner of Pearl and Third streets. The plans call for fourteen through tracks.

Everett, Wash.—According to press reports, the Great Northern will build new wharves, docks and storage tanks for handling fuel oil.

Ft. Dodge, Iowa.—The Minneapolis & St. Louis is building a seven-stall roundhouse and has just completed a new machine shop.

Jamaica, N. Y.—See an item regarding new passenger station for the Long Island Railroad in General News.

Los Angeles, Cal.—Plans have been submitted by the Southern Pacific to the city council of Los Angeles for a tunenl through North Main street. The cost of the improvement will be about $9,200.

Manchester, N. Y.—According to press reports, the Lehigh Valley will build an extensive freight transfer station at Manchester.

Marcus, Wash.—The Great Northern will build a bridge over the Columbia river at Marcus.

Natchitoches, La.—See Louisiana & Northwest under Railway Construction.

New Haven, Conn.—Plans are said to have been approved for a new stone and brick passenger station for the New York, New Haven & Hartford, to be built at New Haven, the work to be finished in about one year.

Obar, N. Mex.—The Chicago, Rock Island & El Paso is building a new station at Obar.

Redfield, Me.—The Maine Central has bought one acre of land in Redfield, to be used as a site for yards and a station.

San Diego, Cal.—The Atchison, Topeka & Santa Fe is planning to put up a new station at San Diego.

Seattle, Wash.—The Oregon & Washington has been granted a permit to build a new bridge on Jackson street. (August 26, p. 375.)

Tacoma, Wash.—The Oregon & Washington has bought land at Tacoma as a site for terminals, freight yards and shipping wharves.

Walnut Springs, Tex.—The roundhouse of the Houston & Texas Central was burned on December 18 and five locomotives which were in the building at the time were badly damaged.

Late News.

The items in this column were received after the classified departments were closed.

The senate on Wednesday confirmed the nominations of B. H. Meyer and C. C. McChord as interstate commerce commissioners.

William R. Butler, of Mauch Chunk, Pa., has been elected a director of the Lehigh Valley to succeed S. P. Wolverton, deceased.

At Pau, France, on Wednesday of this week Mr. Legagneux, the French aviator, flying in the Michelin Cup competition remained in the air from 8:34 a. m. to 2:35 p. m., and made a distance of 516 kilometers, or 320.43 miles.

The Lehigh Valley has declared a semi-annual dividend of 5 per cent. on the common stock. This is an increase of 2 per cent. semi-annually and places the stock on a 10 per cent. per annum basis, as compared with 6 per cent. previously paid.

The Minnesota Railroad Commission at St. Paul, last Tuesday, held a conference with seven signal engineers and three representatives of signal departments—10 railways in all—on the question of drafting a suitable law for Minnesota to regulate the interlocking of signals at crossings; and it was decided to have the question investigated, with a view to seeing if the laws of Illinois and of Canada on this subject would be suitable for application in Minnesota. The chairman of this committee of signal engineers will be Mr. Jorgeson, engineer of the Minnesota commission.

The Pittsburgh, Shawmut & Northern is said to have ordered 6,700 tons of 85-lb. rails from the Carnegie Steel Company. The Mexico North-Western is said to have ordered 5,100 tons of 70-lb. rails from the Tennessee Coal & Iron Company. The Delaware, Lackawanna & Western will probably be in the market shortly for 5,000 tons of bars and track supplies. The Norfolk & Southern is said to be in the market for 8,000 tons of rails. The New York, Ontario & Western is said to be in the market for 10,000 tons of rails. The Delaware & Hudson is said to be in the market for 10,000 tons of rails. The Baltimore & Ohio is considering an order for 40,000 tons of rails.

Walker D. Hines, chairman of the executive committee of the Atchison, Topeka & Santa Fe, told the Hadley Commission on the issuance of railway stocks and bonds (see general news elsewhere in this issue) that, in his opinion, congress has the power to regulate the capitalization of railways engaged in interstate commerce and that he personally was not disposed to offer any objection to the exercise of that power. "I take the broad position," said Mr. Hines, "that any power that can regulate commerce can regulate the operation of the corporations, whose purpose it is to provide the channels of commerce. It is manifest that the public is going to insist upon regulation. It is manifest that state regulation is inadequate; it is a matter far more of federal concern and it follows that eventually and preferably at the very outset federal regulation should be exclusive.

Judge Lovett, president of the Union Pacific and Southern Pacific, said he was in favor of federal regulation rather than state. He added that there was no relation between rate making and regulation. As to the legality of congress to regulate railway rates, Judge Lovett said he was not prepared to give an opinion. He was strongly in favor of the issue of stock without par value. The witness said that if congress had the power to regulate rates it should exercise it so that there would be a uniformity of rates in all states. It should have the exclusive power to fix rates, otherwise he would object to federal regulation at all. The government was not interested, he said, as to whether bonds were good or bad; the interest of the government lay properly in whether the railway received proper consideration for its securities. "It is of no importance what a road owns," he said, "but what it gets." Judge Lovett added that he believed the theory of valuing a railway property by trying to determine the cost of its reproduction was utterly impractical and the adoption of that theory would be exceedingly mischievous.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Kentucky & Indiana Bridge Company will probably be in the market for 2 locomotives shortly.

The Nevada Copper Belt is in the market for one consolidation locomotive, with 18 in. x 24 in. cylinders.

The Lake Superior & Transfer Company has ordered 2 eight-wheel switching locomotives from the Baldwin Locomotive Works.

The Wichita Falls Route has ordered 2 consolidation locomotives and 1 eight-wheel American locomotive from the Baldwin Locomotive Works.

The Cincinnati, New Orleans & Texas Pacific has ordered 10 consolidation locomotives and 5 of the Pacific type from the Baldwin Locomotive Works.

The New York, Ontario & Western has ordered 2 six-wheel switching locomotives and 6 consolidation locomotives from the American Locomotive Company. The switchers will have 20½-in. x 26-in. cylinders, 51-in. driving wheels, and the total weight will be 150,000 lbs. The consolidation locomotives will have 21 in. x 32-in. cylinders, 55-in. driving wheels and the total weight will be 202,000 lbs.

The Boston & Maine has ordered 40 Pacific locomotives from the American Locomotive Company. The cylinders will be 22 in. by 28 in., the driving wheels 73 in., and the total weight 232,000 lbs. The same railway has also ordered 20 6-wheel switcher locomotives from the American Locomotive Company. The cylinders will be 19 in. by 26 in., the driving wheels 51 in., and the total weight 138,000 lbs. This railway has also ordered 40 consolidation locomotives from the Baldwin Locomotive Works.

The Minneapolis, St. Paul & Sault Ste. Marie has ordered 16 Pacific locomotives from the American Locomotive Company. The cylinders will be 25 in. by 26 in., the driving wheels 75 in., and the total weight will be 254,000 lbs. These locomotives will be equipped with superheaters. The same railway has also ordered 15 consolidation locomotives from the American Locomotive Company. The cylinders will be 25 in. by 30 in., the driving wheels will be 63 in., and the total weight will be 225,000 lbs. These locomotives will also be equipped with superheaters.

CAR BUILDING.

The Chicago & Alton is in the market for 25 caboose cars.

The Chesapeake & Ohio is in the market for 200 40-ton flat cars.

The Cold Blast Transportation Company is in the market for 25 all steel tank cars.

The Swift Refrigerator Transportation Company is in the market for 50 produce cars.

The Chicago, New York & Boston Refrigerator Line is in the market for 300 refrigerator cars.

The Atlanta & West Point is in the market for 2 first-class coaches and 2 all-steel postal cars.

The Pittsburgh, Shawmut & Northern will be in the market shortly for 2,000 freight cars, including gondola and flat cars.

The Baltimore & Ohio has ordered 20 60-ft. coaches from the Pullman Company and 30 70-ft. coaches from the American Car & Foundry Company.

The Pennsylvania Equipment Company is in the market for 25 to 50 second-hand wooden self-clearing hopper coal cars of 60,000 to 80,000 lbs. capacity.

The Pittsburgh & Lake Erie has ordered 10 coaches and 2 combination passenger and baggage cars from the American Car & Foundry Company. This report is unconfirmed.

The Great Northern, reported in the *Railway Age Gazette* of December 2 as being in the market for freight equipment, has ordered 500 50-ton ore cars from the American Car & Foundry Company.

The Jamison Coal & Coke Co., Chicago, as reported in the *Railway Age Gazette* of December 16, has ordered 400 50-ton steel hopper coal cars from the Standard Steel Car Co. The inside measurements will be 31 ft. 6 in. long and 9 ft. 4 in. wide. The over all measurements will be 33 ft. 8¾ in. long, 9 ft. 11½ in. wide, 10 ft. 7¾ in. high over sides and 11 ft. 3⅝ in. high over brake shaft. Bodies and underframes will be steel. The capacity will be 100,000 lbs. The following special equipment will be used:

Axles	O. H. steel journals, 5½ in. x 10 in.
Bolsters, body	Cast steel
Bolsters, truck	Diamond arch bar type
Brake beams	Simplex, M. C. B. standard
Brake shoes	Christie gray iron with wrought iron inserts
Couplers	Standard Simplex, 5 in. 7 in. shank
Doors	Drop, in pairs
Door fastenings	Simonton
Draft gear	Westinghouse friction
Journal boxes	M. C. B.
Paint	Two coats black P. R. R. standard
Springs	M. C. B. "D" type
Wheels	Forged steel, 33 in. diameter

Other special equipment will conform generally to B. & O. specifications, the railway on which these cars will be used.

IRON AND STEEL.

The Norfolk & Western has ordered 3,500 tons of bridge steel from the Pennsylvania Steel Company.

The Chesapeake & Ohio is in the market for 15,000 tons of rails, which will be used entirely for renewals.

The Canadian Car & Foundry Company has ordered 20,000 tons of plates and shapes from the Carnegie Steel Company.

The Virginian has ordered about 2,500 tons of bridge steel from the Virginia Bridge & Iron Company, of Roanoke, Va.

General Conditions in Steel.—Steel men believe that the opening of the year will see a readjustment in prices to a lower basis. In any case the prices will not be higher in the near future. The consumers of finished steel products are taking advantage of this and are withholding all orders except those for immediate use. They have nothing to lose by this policy, for the steel industry is now operating at less than 50 per cent. of its capacity and therefore will be able to fill promptly any increase in orders. The steel manufacturers are trying to maintain the present prices by reducing the ouput to suit the demands. The prices of light rails have already been reduced by several independent companies. No agreement to maintain the prices of this product exists, so the falling off in orders found a response in a reduction of prices from $28 a ton to $24, and even to $22 a ton.

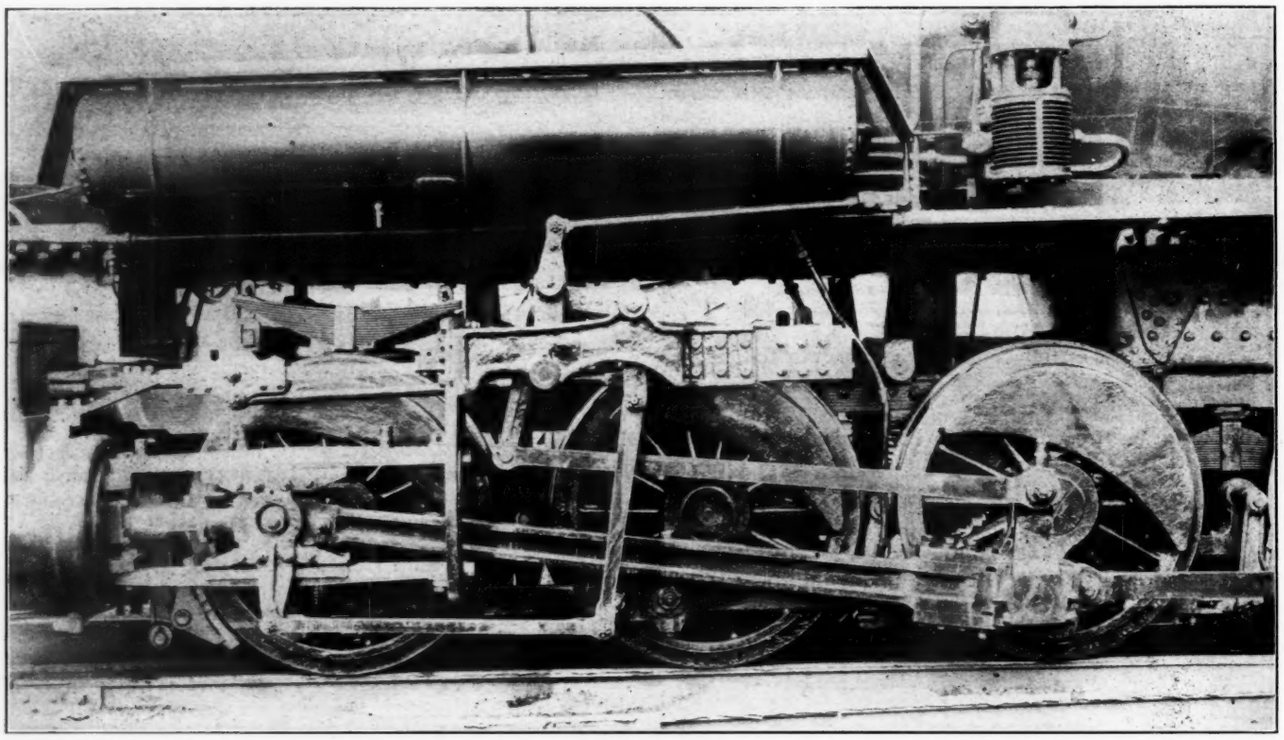
Settlement of Brake Beam Suit.

The litigation which has been pending for the past two and a half years between the Chicago Railway Equipment Company, Chicago, and The Damascus Brake Beam Company, Cleveland, Ohio, has been finally settled, by a decision of the court of last resort, in favor of The Damascus Brake Beam Company. The controversy involved the right to make the split brake-head, which has been marketed (for use on high speed beams) under the designation Waycott Special. Patent No. 886,603, on the invention of Philip T. Handiges, was issued to The Damascus Brake Beam Company on May 5, 1908. Immediately thereafter, an interference proceeding was instituted by the Chicago Railway Equipment Company, which proceeded through the several tribunals of the patent office, each of which decided in favor of The Damascus Brake Beam Company, and finally went to the Court of Appeals of the District of Columbia, which is the tribunal of last resort on a question of this kind, and which has just handed down its opinion, written by Associate Justice Van Orsdale, affirming the right of The Damascus Brake Beam Company to its patent. As is usual in matters of this kind, more or less effort was made during the pendency of the

litigation to impress on the purchasers of the goods the possibility of being ultimately forced to reckon with a rival manufacturer. The decision in favor of The Damascus Brake Beam Company sustains the right of that concern to make and sell the split brake-head in question.

The Improved Baker-Pilliod Valve Gear.

Reports from the locomotive works this year show an increasing number of locomotives built with the Baker-Pilliod valve gear; with the successive applications there has been found opportunity to improve the gear, making it simpler, with fewer parts, lighter, and, consequently, at a lower cost both for original construction and repairs. The development of this gear has been somewhat like that of the Walschaert. The earlier forms of the latter, as used in this country, were not well balanced, and there has been a constant effort to improve the gear in this direction. The same is true of the Baker-Pilliod. In the original construction some of the levers were irregularly loaded, producing twisting moments and unequal wear, but the new form as here illustrated is well balanced and much more symmetrical about the center line of motion. The Baker-Pilliod gear as applied to a Pacific type of locomotive on the Chicago & Alton was illustrated and described in the *Railway Age Gazette* January 15, 1909. Some of the recent improvements relate to better facilities in the way of construction and repairs and others to a better movement of the gear itself, securing a more perfect control of the valve motion.



Improved Baker-Pilliod Valve Gear as Applied to a Consolidation Locomotive.

Commencing with the housing or fixed portion of the device, the frame is now made in one piece instead of two, as formerly, and the same casting serves for either side of the engine, replacing the four castings which were formerly required. The new frame is equipped with an extension which permits of the use of the same frame on a variety of engines. One design also serves for the bell crank, as there is now sufficient valve travel obtained to make it answer for a variety of engines.

The reach rod connects at the center of the top of the yoke instead of on the inside, as formerly. The trunnions on the radius bar are bushed in the new gear and the lower end is fitted with a taper pin, so as to connect with the gear connection rod. Several important improvements have been made in the location and design of the bell crank. It is now centrally hung and held in the frame by taper-fitted pins. The pins are larger and much longer than in the old practice and the horizontal arm of the bell crank is now on the center line of the gear. It has two vertical arms instead of one, and its position has been shifted forward, so that the vertical arm connects to the gear connection rod.

The eccentric arm which was used originally has been dispensed with, and the gear connection rod now connects the bell crank with the lower end of the radius bar and continues on down to a connection with the front end of the eccentric rod. One of the most important improvements is the change in position of the eccentric rod. The excessive angularity of this rod in the former design was an objectionable feature, and this has been happily remedied by the use of the gear connection rod, which allows the eccentric rod to assume a nearly horizontal position. With the gear as now designed the combination lever no longer carries the weight of the back end of the eccentric arm and the front end of the eccentric rod. This was one of the principal causes of wear in the old gear.

We have referred to the symmetrical design of the new gear, and it will be seen that nearly all parts are centrally hung, except the combination lever, and its offset is utilized as a means of transferring motion from the center line of the eccentric rod to the center line of the valve. This is the only lever in the new gear that is subject to twisting moments. In the present construction special attention has been given to the prevention of wear, and all pins are in double shear, taper-fitted, amply keyed, and are all arranged so as to be easily removed for repairs. Improvements have also been made in the methods of lubrication, and each separate detail is now provided with an oil cavity integral with the part and no loose cups are used. The new design dispenses with an objectionable irregularity which was found in the old gear, that due to the curved path of the front end of the eccentric rod. This path is now an arc of a circle, and the valve events are more nearly square in all positions. By this change it is possible to equalize the port openings in full gear.

A comparison of the design here illustrated with that of the former gear will make it evident that considerable improvement has been secured. Every desirable feature in an ideal valve motion is now obtained and many of the objections in the older forms of link motion are entirely overcome. Such a device, which has already demonstrated its good qualities, should now appeal more strongly to those interested in improving this vital part of the locomotive. This valve gear is made by The Pilliod Company, New York.

ANNUAL REPORT

SOUTHERN PACIFIC COMPANY—TWENTY-SIXTH ANNUAL REPORT.

INCOME FOR THE YEAR.

The gross receipts and disbursements of the Southern Pacific Company in respect of its leased lines and of the Proprietary Companies in respect of lines not leased, and the other receipts and disbursements of the Southern Pacific Company and of such Proprietary Companies, after excluding all offsetting transactions between them, were as follows:

	Year Ended June 30, 1910.	Year Ended June 30, 1909.	+Increase. —Decrease.
Average miles of railway operated—proprietary and non-proprietary	9,752.26	9,626.43	+ 125.83
TRANSPORTATION OPERATIONS.			
Gross operating revenues	$124,523,905.08	$110,846,404.46	+$13,677,500.62
Outside operations—revenues	10,498,701.79	9,675,504.28	+ 823,197.51
Total	$135,022,606.87	$120,521,908.74	+$14,500,698.13
Operating expenses	$73,514,034.42	$67,191,874.66	+ $6,322,159.76
Outside operations—expenses	9,750,813.57	8,604,258.34	+ 1,146,555.23
Taxes (rail lines and properties dealt with as outside operations)	4,519,374.01	3,788,242.14	+ 731,131.87
Total	$87,784,222.00	$79,584,375.14	+ $8,199,846.86
Revenue over expenses and taxes	$47,238,384.87	$40,937,533.60	+ $6,300,851.27
INCOME OTHER THAN FROM TRANSPORTATION OPERATIONS.			
Interest on bonds owned of Proprietary Companies (Table No. 4)	$854,174.84	$819,018.73	+ $35,156.11
Interest on bonds owned of companies other than Proprietary Companies (Table No. 4)	1,285,723.65	867,711.80	+ 418,011.85
Dividends on stocks owned of companies other than Proprietary Companies (Table No. 5)	*5,939,573.28	992,492.22	+ 4,947,081.06
Income from lands and securities not pledged for redemption of bonds	894,164.31	821,858.12	+ 72,306.19
Income from sinking funds pledged for the redemption of bonds	161,514.97	205,800.00	— 44,285.03
Balance of interest received on loans and of interest accruing to June 30, on open accounts other than with Proprietary Companies	1,508,878.56	1,430,663.96	+ 78,214.60
Miscellaneous income	65,150.84	60,177.50	+ 4,973.34
Total	$10,709,180.45	$5,197,722.33	+ $5,511,458.12
Surplus	$57,947,565.32	$46,135,255.93	+$11,812,309.39

*Includes $4,590,000 extra dividend from Wells Fargo & Co.'s Express.

FIXED CHARGES.			
Interest on outstanding funded debt of Southern Pacific Co. and Proprietary Companies (Table No. 6)	$20,200,665.24	$17,121,743.73	+ $3,078,921.51
Sinking fund contributions and income from sinking fund investments	378,514.97	572,800.00	— 194,285.03
Hire of equipment—balance	448,342.77	404,051.30	+ 44,291.47
	$21,027,522.98	$18,098,595.03	+ $2,928,927.95
Less rentals for lease of road, for joint track, yards, and other facilities, viz.: Collections $179,619.88 Payments 398,734.68	320,885.20	529,624.89	— 208,739.69
Total fixed charges	$20,706,637.78	$17,568,970.14	+ $3,137,667.64
Surplus over fixed charges	$37,240,927.54	$28,566,285.79	+ $8,674,641.75
OTHER CHARGES.			
Land department expenses	$113,866.28	$103,286.95	+ $10,579.33
Taxes on granted and other lands	278,085.58	246,181.00	+ 31,904.58
Miscellaneous expenses	29,260.10	54,934.68	— 25,674.58
Taxes and other expenses of Southern Pacific Company	317,082.52	414,668.92	— 97,586.40
Additions and betterments payable from income of Southern Pacific Company	511,819.89	503,847.75	+ 7,972.14
Reserve for depreciation of rolling stock owned by Southern Pacific Company and leased to other companies	527,594.94	363,964.08	+ 163,630.86
Total other charges	$1,777,709.31	$1,686,883.38	+ $90,825.93
Surplus over fixed and other charges	$35,463,218.23	$26,879,402.41	+ $8,583,815.82

ASSETS AND LIABILITIES.

The details of the assets and liabilities of the Southern Pacific Company as shown in Table No. 11, and those of the Proprietary Companies in Tables Nos. 17 and 18. The value of the granted lands belonging to the Central Pacific Railway Company, the Oregon and California Railroad Company, and the Southern Pacific Railroad Company, which remained unsold at the close of the year, is not included in the statement of the assets of said companies, but the proceeds and all transactions in respect of said lands as shown in Tables Nos. 22 and 23.

The resources of the Southern Pacific Company and Proprietary Companies for the year, and the disposition made thereof (excluding offsetting accounts between them), briefly stated, were as follows:

Cash on hand July 1, 1909			$32,190,997.41
Increase during the year in outstanding stocks and bonds of Southern Pacific Company, Table No. 11		$9,240,001.29	
Increase during the year in outstanding stocks and bonds of Proprietary Companies, Table No. 18		5,576,083.47	14,816,084.76
Borrowed from Union Pacific Railroad Company			10,901,568.97
Increase in current cash liabilities			1,670,780.31
Sinking fund investments released on maturity and redemption of bonds		$1,399,603.48	
Less increase in sinking funds and trust funds		331,942.49	1,067,660.99
Increase in reserve for refunding outstanding old bonds of Southern Pacific R. R. Co.			1,566,151.50
Increase in reserve funds and other contingent liabilities			949,946.75
Decrease in contingent assets			2,777,248.85
Gain in profit and loss, viz.:			
Income from transportation operations	$135,022,606.87		
Income other than from transportation operations	10,709,180.45		
Profits on stocks sold, proceeds from sale of lands, and other profit and loss credits	9,261,788.92		
		$154,993,576.24	
Deduct:			
Operating expenses and taxes	$87,784,222.00		
Fixed and other income charges	22,530,669.78		
Dividend on common stock	17,238,346.93		
Discount and commission on capital issues	1,992,181.75		
Reserve for refunding outstanding old bonds of Southern Pacific R. R. Co. and other profit and loss charges	4,895,438.30		
		134,440,858.76	20,552,717.48
Total resources for the year			$86,493,157.02
Applied as follows:			
For construction of new lines, additions, betterments, equipments, and other property as shown in detail under "Capital Expenditures"		$38,157,575.91	
For stocks and bonds of Proprietary Companies acquired during the year, as shown in detail in Tables Nos. 12 and 13: Purchased for cash	$6,106,769.67		
Taken over in settlement of advances	13,470,487.57		
	$19,577,257.24		
Deduct: cost on books of securities sold, exchanged, redeemed, or cancelled	715,921.12		
		18,861,336.12	
For stocks and bonds of other companies acquired during the year as shown in detail in Table No. 14: Purchased for cash	$10,565,351.61		
Deduct: cost on books of securities sold, redeemed, or cancelled	2,700,967.85		
		7,864,383.76	
Increase in current cash assets	$1,602,979.49		
Deduct: decrease in deferred assets	527,916.78		
		1,075,062.71	
Increase in material and supplies		1,585,081.72	
Increase in loans, deposits, and notes receivable		7,722,494.47	75,265,934.69
Balance—Cash on hand June 30, 1910			11,227,222.33
			$86,493,157.02

The combined assets and liabilities, excluding therefrom the stocks of the Proprietary Companies deposited against the issue of stocks and bonds of the Southern Pacific Company, also the offsetting open accounts between the Southern Pacific Company and the Proprietary Companies, on June 30, 1910, summarized, were as follows:

Capital Assets.		
Cost of road and franchises		$734,865,369.03
Stocks and bonds of Proprietary Companies—unpledged	45,408,883.94	
Stocks and bonds of other companies—unpledged	51,551,638.95	
Bay Shore Line Terminals, and other real estate	31,938,448.59	
Timber treating plants, saw mills, and other property	404,698.70	
Steamships and other floating equipment	12,625,710.07	
Rolling stock	16,222,784.92	
Advances for construction and acquisition of new lines	33,545,888.99	
Advances to Southern Pacific Railroad Co. of Mexico	35,965,601.75	
Advances to electric lines in California	12,103,947.75	
Advances to Kern Trading & Oil Co.	4,086,700.63	
Advances to Pacific Fruit Express Co.	1,165,212.25	
Lands and other investments	1,908,905.19	
Sinking funds	14,773,183.62	
Trust funds	692,473.15	
		$997,259,447.53
Current and Deferred Assets.		
Cash	$11,227,222.33	
Time loans and deposits	17,047,375.62	
Cash accounts	15,892,508.33	
Material and supplies	14,679,725.04	
Lands and other investments	711,147.41	
		59,557,978.73
Contingent Assets.		
San Antonio & Aransas Pass Ry. Co.	$1,390,753.59	
Expenditures closing crevasse of Colorado River, protection of levees, etc.	4,022,480.29	
Unadjusted accounts	739,133.29	
Land contracts	1,150,087.17	
		7,302,454.34
Total		$1,064,119,880.60
Capital Liabilities.		
Southern Pacific Company, common stock		$272,672,305.64
Southern Pacific Company, preferred stock called for redemption but not presented	18,325.00	
Proprietary Companies:		
Common stock (stock pledged by Southern Pacific Company excluded)	77,563,111.00	
Preferred stock (stock pledged by Southern Pacific Company, excluded)	12,000,000.00	
		$362,253,741.64
Southern Pacific Company, funded debt	$126,792,540.00	
Proprietary Companies, funded debt	361,288,896.35	
		488,081,436.35
Total stocks and bonds		$850,335,177.99
Current and Deferred Liabilities.		
Interest and dividends matured—unpaid	$644,155.00	
Interest and dividends due July 1 and October 1	11,717,373,73	
Interest accrued to June 30, but not due	4,007,538.47	
Due to Union Pacific Railroad Co.	10,901,568.97	
Vouchers and pay-rolls	12,058,556.12	
Other cash accounts	1,297,328.61	
Deferred liabilities	1,702,393.87	
		42,328,914.77
Contingent Liabilities.		
Insurance funds	$5,119,725.50	
Rolling stock and floating equipment depreciation and replacement funds	7,130,144.44	
Unadjusted accounts	3,113,859.32	
Principal of deferred payments on land contracts	1,626,647.59	
Fund for refunding outstanding old bonds of Southern Pacific R. R. Co.	2,539,604.38	
		19,529,981.23
Difference between par value of stocks of Proprietary Companies and the par value of stock and face value of bonds of the Southern Pacific Company issued therefor		16,720,493.59
Balance to credit of profit and loss		135,205,313.02
Total		$1,064,119,880.60

EQUIPMENT.

The accounting regulations of the Interstate Commerce Commission in respect to charges for "Additions and Betterments," effective July 1, 1909, require that the original cost (estimated if not known) of equipment retired be credited, and the cost of equipment acquired be charged directly to the equipment accounts. The changes during the year in the equipment dealt with in accordance with these regulations, were as follows:

	Condemned, destroyed, sold or transferred to another class, and credited to Equipment. Number.	Added and Charged to Equipment. Number.	Added and Charged to Free Asset, S. P. Co. Number.	Added and Charged to Total. Number.
Locomotives	49	37	*4	33
Baggage cars	18	4	64	68
Baggage and mail cars	1	8	*8	—
Baggage and passenger cars.	3	—	—	—
Business cars	2	1	—	1
Chair cars	1	—	—	—
Dining cars	—	3	12	15
Motor cars (gasoline)	—	—	8	8
Motor car trailers	—	—	8	8
Observation cars	—	3	4	7
Passenger cars	45	56	105	161
Postal cars	3	1	10	11
Narrow gauge cars	19	—	—	—
Total passenger-train cars.	92	76	203	279
Box cars	1,500	252	1,851	2,103
Caboose cars	19	—	—	—
Flat cars	594	128	500	628
Fruit cars	17	—	—	—
Furniture cars	7	—	—	—
Gondola cars	84	202	50	252
Gondola (H. B.) cars	5	—	—	—
Logging cars	—	75	—	75
Refrigerator cars	4	—	—	—
Stock cars	36	—	—	—
Tank (Oil) cars	4	53	*50	3
Narrow gauge cars	187	3	—	3
Total freight-train cars	2,457	713	2,351	3,064
Work equipment	210	925	218	1,143

The original cost of locomotives condemned, destroyed, sold or transferred to another class and credited to equipment was $535,045.81; of total passenger-train cars, $455,325.42; of total freight-train cars, $1,301,014.69; of work equipment, $81,714.14; making a toatl of $2,372,100.06. The cost of locomotives added and charged to equipment was $545,823.08; of total passenger-train cars, $593,461.83; of total freight-train cars, $703,217.38; of work equipment, $282,939.43; making a total of $2,127,441.71. The cost of locomotives added and charged to free assets S. P. Co. was †$256,042.84; of total passenger-train cars, $2,001,492.14; of total freight-train cars, $2,667,656.75; of work equipment, $144,118.12; making a total of $5,069,-309.85. The total cost of locomotives added and charged to equipment and to free assets S. P. Co. was $801,865.92; of total passenger-train cars, $2,596,953.97; of total freight-train cars, $3,370,874.13; of work equipment, $427,057.55; making a grand total of $7,196,751.57.

*Credit. †Caused by the purchase of 12 Mallet Mogul and 13 Mallet Consolidation and the sale of 33 locomotives of lighter weight.

The original cost, salvage value, and amount charged to the operating expenses of the equipment retired during the year were as follows:

	Locomotives.	Passenger-train Cars.	Freight-train Cars.	Work Equipment.	Total.
Original cost (estimated if not known)	$535,045.81	$454,325.42	$1,301,014.69	$81,714.14	$2,372,100.06
Proceeds from sale or salvage value	156,113.21	293,040.13	506,624.35	39,645.00	995,422.69
Charged to Operating Expenses	$378,932.60	$161,285.29	$794,390.34	$42,069.14	$1,376,677.37

The locomotives added during the year averaged 102.21 tons total weight of engine, without tender, and 92.70 tons upon drivers, and freight-train cars 50 tons capacity.

The number of locomotives and cars of standard gauge owned, and the total average capacity of freight-train cars at the close of the year were as follows:

	This Year.	Last Year.	Inc. or Decrease.	Per Cent.
Locomotives	1,808	1,822	—14	.77
Total weight, excluding tender (tons)	134,790	131,565	3,225	2.45
Average weight, excluding tender (tons)	74.02	71,62	2.40	3.35
Total weight on drivers (tons)	111,097	108,013	3,084	2.86
Average weight on drivers (tons)	61.01	58.80	2.21	3.76
Passenger-train cars	1,942	1,736	206	11.87
Freight-train cars	44,979	44,188	791	1.79
Total capacity (tons)	1,728,039	1,632,708	95,331	5.84
Average capacity (tons)	39.05	37.58	1.47	3.91
Work equipment	6,318	5,375	943	17.54

The equipment owned by the respective companies is shown in Tables Nos. 24 and 25. The changes during the year, the capacity, and the service of all equipment, are shown in Tables Nos. 33, 34 and 35.

TRANSPORTATION OPERATIONS.

The results of the year's transportation operations compared with those of the preceding year are as follows:

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Average miles of railway operated	9,752.26	9,626.43	125.83	1.31
Revenues.				
Passenger, including extra baggage	$40,244,855.79	$34,345,339.36	$5,899,516.43	17.18
Mail and express	4,976,272.55	4,628,261.29	348,011.26	7.52
Freight	77,018,554.26	69,878,880.14	7,139,674.12	10.22
Switching, rentals, and all other sources	2,284,222.48	1,993,923.67	290,298.81	14.56
Total rail lines	$124,523,905.08	$110,846,404.46	$13,677,500.62	12.34
Outside operations—revenue	10,498,701.79	9,675,504.28	823,197.51	8.51
Total revenues	$135,022,606.87	$120,521,908.74	$14,500,698.13	12.03

Operating Expenses.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Maintenance of way and structures	$16,098,705.22	$14,533,135.25	$1,565,569.97	10.77
Maintenance of equipment	15,808,390.67	14,379,762.48	1,428,628.19	9.93
Traffic expenses	2,481,186.30	2,069,939.51	411,246.79	19.87
Transportation expenses	35,658,045.72	32,846,193.00	2,811,852.72	8.56
General expenses	3,467,706.51	3,362,844.42	104,862.09	3.12
Total rail lines	$73,514,034.42	$67,191,874.66	$6,322,159.76	9.41
Outside operations—expenses	9,750,813.57	8,604,258.34	1,146,555.23	13.33
Total expenses	$83,264,847.99	$75,796,133.00	$7,468,714.99	9.85
Gross revenues over total expenses	$51,757,758.88	$44,725,775.74	$7,031,983.14	15.72

Passenger Traffic.

Revenue passengers carried	40,190,200	39,337,735	852,465	2.17
Revenue passengers carried one mile	1,805,834,993	1,541,212,518	264,622,475	17.17
Revenue from passenger trains per mile of road (*a*)	$4,553.98	$3,961.01	$592.97	14.97
Revenue from passenger trains per *revenue train* mile (*a*) (*b*)	$1.89	$1.84	$0.05	2.72
Average revenue per passenger per mile	2.188 cents	2.185 cents	.003 cents	.14
Average distance carried	44.93 miles	39.18 miles	5.75 miles	14.68

Freight Traffic.

(Way-bill Tonnage.)

Tons of revenue freight carried	25,962,704	22,713,143	3,249,561	14.31
Tons of revenue freight carried one mile	6,628,685,724	6,055,858,314	572,827,410	9.46
Ton miles per mile of road — revenue freight (*a*)	678,797	629,087	49,710	7.90
Revenue from freight per mile of road (*a*)	$7,772.58	$7,121.07	$651.51	9.15
Revenue from freight per *revenue train* mile (*a*) (*c*)	$4.53	$4.38	$0.15	3.43
Average receipts per ton per mile—revenue freight	1.162 cents	1.154 cents	.008 cents	.69
Average distance carried—all freight	243.42 miles	256.52 miles	—13.10 miles	5.11

(*a*) Based on traffic over rail lines only, length of ferries used between rail stations excluded in distance over which traffic was moved. (*b*) Revenue passenger trains and *all* mixed train miles, including 553,003 miles run by motor cars. (*c*) Revenue freight train and *all* mixed train miles.

Compared with the preceding year, the per cent. of operating expenses (including expenses of outside operations) to the gross revenues (including those from outside operations) was as follows:

Rail Lines.

	This Year.	Last Year.
For "Maintenance" (*Maintenance of Way and Structures, and Maintenance of Equipment*)	25.62	26.08
For "Operation" (*Traffic Expenses, Transportation Expenses, and General Expenses*)	33.41	34.53
Total rail lines	59.03	60.61
Total rail lines and outside operations	61.67	62.89

The operating revenues and operating expenses for the year for all lines, distributed among the respective primary accounts provided for in the classification promulgated by the Interstate Commerce Commission, are shown in Table No. 28 and for each Company in Table No. 29. The details of passenger and freight traffic are shown in Tables Nos. 31 and 32.

The expenses for "Maintenance" increased $2,994,198.16, or 10.36 per cent., and for Operation $3,327,961.60, or 8.70 per cent., a total increase of $6,322,159.76, or 9.41 per cent. These increases resulted principally from the greater amount of repairs and renewals made during the year, the greater mileage of locomotives and of cars, and the higher wage schedules.

The increase in expenses for outside operations occurred in the operation of the steamship lines and in the dining car, restaurant and hotel service, resulting principally from the increase in service to the public and from the higher cost of operation.

There are in service twenty-three gasoline motor cars. The mileage of these cars, aggregating 553,003 miles, is included in the mileage statistics.

In the following statements the operating expenses, charged as provided for in the classification of the Interstate Commerce Commission, have been combined under comprehensive titles of accounts so as to present the year's expenses in a concise form.

Maintenance of Way and Structures.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Average miles operated—first and additional main tracks	9,989.40	9,858.22	131.18	1.33
Ballast	$438,785.22	$171,831.84	$266,953.38	155.36
Ties	1,900,097.81	2,065,206.05	—$165,108.24	7.99
Rails	812,116.76	1,294,691.11	—482,574.35	37.27
Frogs, switches, and other track material	1,722,552.05	1,414,415.24	308,136.81	21.79
Total material roadway and track	$4,873,551.84	$4,946,144.24	—$72,592.40	1.47
Repairs of roadway and track	6,357,014.43	5,419,665.25	937,349.18	17.30
Bridges, trestles, and culverts	1,203,268.68	1,177,362.39	25,906.29	2.20
Buildings, grounds, and appurtenances	2,178,647.77	1,876,373.58	302,274.19	16.11
Snow and sand fences, and snow sheds	181,324.31	130,954.91	50,369.40	38.46
Electric power, telegraph, and telephone lines	138,810.69	165,997.75	—27,187.06	16.38
Superintendence	832,846.56	726,198.93	106,647.63	14.69
Stationery and printing	40,138.91	29,200.02	10,938.89	37.46
Other expenses	92,817.18	61,238.18	31,579.00	51.57
Property abandoned	200,284.85	.....	200,284.85	.....
Total	$16,098,705.22	$14.533,135.25	$1,565,569.97	10.77
Cost per mile — all main tracks	$1,611.58	$1,474.21	$137.37	9.32

The increase resulted principally from the maintenance of 131 miles of additional main tracks and 142 miles of sidings, the cost of labor of replacing 216 miles more of rails this year than were replaced last year, from the higher wage schedules, and from charges under the rules of the Interstate Commerce Commission for property abandoned formerly charged to "Profit and Loss."

The following rails, ties, tie plates, and continuous rail joints were used in making renewals, and the entire cost thereof charged to operating expenses, with the exception of $975,356.61 for increased weight of rail, and improved frogs and switches. In accordance with the Classification of Expenditures for Additions and Betterments promulgated by the Interstate Commerce Commission this sum was charged to capital expenditures.

	This Year.	Last Year.	+Increase. —Decrease.
Miles of new steel rails	757.74	541.07	+ 216.67
Per cent. of renewals of all rail in track, including sidings	5.69	4.14	+ 1.55
Number of burnettized ties	2,231,076	1,551,217	+ 679,859
Number of other ties	1,383,337	1,726,175	— 342,838
Total number of ties	3,614,413	3,277,392	+ 337,021
Equal to miles of continuous track	1,277.18	1,162.31	+ 114.87
Per cent. of renewal of all ties in track, including sidings	9.59	8.89	+ .70
Number of tie plates	6,647,605	4,071,970	+2,575,635
Equal to miles of continuous track	1,174.49	722.05	+ 452.44
Number of continuous rail joints	566,798	349,306	+ 217,492
Equal to miles of continuous track	805.11	496.17	+ 308.94

The weight of rails per yard in main line and branches at the close of the year was as follows:

Miles of first and additional main tracks operated, excluding mileage operated under trackage rights.	Total.	141-lb.	116-lb.	96-lb.	90-lb.	80-lb.	76 and 75-lb.	70-lb.	65-lb.	61.5 and 60-lb.	56-lb.	54.6 and 54-lb.	52-lb.	50-lb. and less than 50-lb.
Main line	5,603.47	1.11	—	20.37	696.55	2,666.34	2,069.14	—	—	113.07	12.14	—	—	24.75
Branches	4,382.57	.65	.24	.38	71.82	125.20	641.17	10.72	244.15	1,619.10	118.46	297.02	88.48	1,165.18
Total	9,986.04	1.76	.24	20.75	768.37	2,791.54	2,710.31	10.72	244.15	1,732.17	130.60	297.02	88.48	1,189.93
Per cent. of total miles of track.	100.00	.02	—	.21	7.69	27.96	27.14	.11	2.44	17.34	1.31	2.97	.89	11.92
Per cent. last year	100.00	.02	—	.21	2.55	29.48	29.04	.11	.68	18.01	2.42	2.34	.90	14.24

At the timber treating plants of the companies, 2,340,676 cross ties and 29,899 switch ties were burnettized and 4,868 cross ties and 970,331 cubic feet of piling and other timber were creosoted.

Maintenance of Equipment.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Locomotives	$6,452,213.63	$5,848,394.35	$603,819.28	10.32
Passenger-train cars	1,913,598.23	1,527,519.39	386,078.84	25.28
Freight-train cars	5,665,182.95	5,399,991.54	265,191.41	4.91
Work equipment	338,764.54	323,629.58	15,134.96	4.68
Floating equipment	331,417.59	341,903.62	—10,486.03	3.07
Shop machinery and tools	372,183.43	298,856.08	73,327.35	24.54
Superintendence	631,900.65	540,515.72	91,384.93	16.91
Other expenses	103,129.65	98,952.20	4,177.45	4.22
Total	$15,808,390.67	$14,379,762.48	$1,428,628.19	9.93

Although a part of the increase resulted from higher wage schedules and increased price of material, the greater part thereof resulted from the greater service of the equipment. In mileage of locomotives there was an increase of 11.49 per cent., of passenger-train cars of 12.32 per cent., and of freight-train cars of 10.00 per cent.

As in the past, the companies have charged to operating expenses the original cost (estimated, if not known), less salvage, or purchase price of all equipment condemned, destroyed, sold, or vacated from any cause during the year. The amount thus charged is reported under the item of "Renewals" in Table No. 28, and amounted to $1,376,677.37 against $1,365,771.92 last year.

The average cost of repairs and renewals per locomotive and per car per annum, and the average number of serviceable locomotives and cars owned during the year were:

	Average Cost per Annum.		Av. Serviceable Number.	
	This Year.	Last Year.	This Year.	Last Year.
Locomotives, for repairs	$3,342.82	$2,973.37		
for renewals	208.09	208.74		
Total	$3,550.91	$3,182.11	1,821	1,846
Passenger-train cars, for repairs	$1,032.14	$910.33		
for renewals	86.25	51.90		
Total	$1,118.39	$962.23	1,883	1,759
Freight-train cars, for repairs	$108.55	$103.65		
for renewals	17.70	19.05		
Total	$126.25	$122.70	44,873	44,011

The equipment owned by the respective Companies is shown in Table No. 25, and the capacity, the service, and the average cost of maintenance, are shown in Tables Nos. 33, 34, and 35.

Traffic Expenses.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Outside agencies	$964,728.18	$857,529.16	$107,199.02	12.50
Advertising	680,402.51	414,008.69	266,393.82	64.34
Superintendence	582,875.60	571,942.87	10,932.73	1.91
Stationery and printing	210,652.50	210,630.56	21.94	.01
Other expenses	42,527.51	15,828.23	26,699.28	168.68
	$2,481,186.30	$2,069,939.51	$411,246.79	19.87

The Interstate Commerce Commission accounting regulations require that transportation issued in payment for advertising should be credited to Passenger Revenue and the equivalent charged to Operating Expenses. This accounting regulation has caused the greater part of the increase in advertising.

Transportation Expenses.

	This Year.	Last Year.	Increase or Decrease.	Per Cent,
Locomotives, fuel for	$9,061,522.80	$7,988,454.54	$1,073,068.26	13.43
Locomotive service, other than fuel	7,306,933.04	6,453,241.74	853,691.30	13.23
Train service	5,865,668.33	5,136,827.76	728,840.57	14.19
Station and terminal service	8,627,740.71	8,222,464.62	405,276.09	4.93
Ferry and river service	675,816.87	647,573.69	28,243.18	4.36
Injuries, loss, damage, and other casualties	2,256,754.68	2,709,161.05	—452,406.37	16.70
Superintendence	1,459,396.31	1,345,488.49	113,907.82	8.47
Stationery and printing	331,100.99	287,355.07	43,745.92	15.22
Other expenses	73,111.99	55,626.04	17,485.95	31.43
	$35,658,045.72	$32,846,193.00	$2,811,852.72	8.56

The work done by the transportation department of the rail lines over that of last year is shown in the following table:

	Increase.	Per Cent.
Gross operating revenues	$13,677,500.62	12.34
Transportation expenses	2,811,852.72	8.56
Revenue passengers carried one mile	264,622,475	17.17
Mileage of cars in passenger service	16,431,224	12.32
Locomotive mileage with passenger trains, including helping	3,281,696	14.71
Tons of revenue freight carried one mile	572,827,410	9.46
Tons of revenue and company freight carried one mile	758,049,388	10.51
Mileage of cars in freight service	50,199,961	10.00
Locomotive mileage with freight and mixed trains, including helping	1,373,678	7.16
Total locomotive mileage in service for which the attendant expenses are charged to "Transportation Expenses"	5,434,376	11.49

The average number of tons of freight per train, of loaded cars per train (excluding caboose), and of tons per loaded car for the year were:

Revenue and Company Freight. (Way-bill Tonnage.)	*Tons per Train.			Loaded Cars per Train.			Per Cent. of Loaded Car Mileage to Total Car Mileage.	Tons per Loaded Car.		
	Tons.	+Increase. —Decrease.		Cars.	+Increase. —Decrease.			Tons.	+Increase. —Decrease.	
		Tons.	Per Cent.		Cars.	Per Cent.			Tons.	Per Cent.
Lines east of El Paso	382.79	— 3.28	.85	18.89	— .16	.84	70.29—1.10	20.26	— .48	2.31
Lines west of El Paso	528.15	+ 24.69	4.90	25.02	+ .60	2.46	71.46— .91	21.11	+ .50	2.43
Average all lines	476.03	+ 15.53	3.37	22.82	+ .39	1.74	71.11— .93	20.86	+ .33	1.61

*Ton miles per revenue freight train and all mixed train miles.

The cost per locomotive mile run in revenue service and in non-revenue service for which the expenses are charged to "Transportation Expenses" was:

	This Year.	Last Year.	+Increase. —Decrease.
For fuel for locomotives	17.189 cents.	16.895 cents.	+ .294 cents.
For all transportation expenses	67.641 cents.	69.489 cents.	—1.848 cents.

General Expenses.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Salaries and expenses of general officers	$300,944.92	$348,549.88	—$47,604.96	13.66
Salaries and expenses of clerks and attendants	1,649,445.36	1,643,814.51	5,630.85	.34
Law expenses	491,720.43	496,707.99	—4,987.56	1.00
General office expenses	203,845.70	219,599.13	—15,753.43	7.17
Stationery and printing	157,685.82	125,048.45	32,637.37	26.10
Insurance	310,574.31	305,079.71	5,494.60	1.80
Pensions	175,090.77	143,666.28	31,424.49	21.87
Other expenses	178,399.20	80,378.47	98,020.73	121.95
Total	$3,467,706.51	$3,362,844.42	$104,862.09	3.12

GENERAL.

Under the concessions granted for the construction of the railway of the Southern Pacific Railroad of Mexico, referred to in the last annual report, there were completed during the year 115.84 miles, making a total of 899.69 miles of railway completed to June 30, 1910.

The miles of railway projected under the concessions, the miles completed, under construction, and remaining to be constructed are as follows:

	Projected. Miles.	Constructed to June 30, 1910. Miles.	Remaining to be Built. Under Construction. Miles.	Remaining to be Built. To be Built. Miles.
Main Line—Empalme to Guadalajara	840.64	669.87	11.78	158.99
Branch Lines	652.51	229.82	—	422.69
Total	1,493.15	899.69	11.78	581.68

Under the concessions to the Southern Pacific Company, 170.77 miles remain to be completed by November, 1912, and, under the concession to the Cananea, Yaqui River and Pacific Railroad Company, 422.69 miles by May, 1914.

The advances by the Southern Pacific Company for account of the construction of these lines, amounted on June 30, 1910, to $35,965,601.75. Interest accruing during the year on these advances has not been taken into the "Income for the year" or the assets of the Company.

In addition to the completed lines of railway reported under "Properties and Mileage" and the railway of the Southern Pacific Railroad of Mexico, hereinbefore referred to, construction is progressing on the following lines:

	Length of Projected Line. Miles.	Track Completed. Miles.	Grading Completed. Miles.	Grading Progressing. Miles.
Arizona Eastern Railroad:				
Phoenix to Hassayampa, Arizona	39.22	19.91	1.59	12.80
Winkelman to San Carlos, Arizona	32.79	.94	6.23	
Beaverton & Willsburg Railroad:				
Beaverton to Willsburg, Oregon	10.55	10.50	.05	
California Northeastern Railway:				
Weed, California, to Klamath Falls, Oregon	88.72	88.72		
Central California Railway:				
Niles to Redwood City, California	16.24	15.52	.72	
Louisiana Western Railroad:				
Eunice to Mamou, Louisiana	10.76	9.50		
Morgan's Louisiana & Texas R. R. & S. S. Co.:				
Lafayette to Port Allen, Louisiana	52.57	49.12	2.50	
Nevada & California Railway:				
Olancha to Owenyo, California	29.50	—	29.50	
Oregon Eastern Railway:				
Natron to Klamath Falls, Oregon	193.80	—	17.13	15.85
Oregon Western Railway:				
Drain to Marshfield, Oregon	73.12	—	—	3.24
Pacific Railway & Navigation Company:				
Hillsboro to Tillamook, Oregon	91.00	59.00		
Sacramento Southern Railroad:				
Sacramento to Walnut Grove, California	23.90	10.12	7.80	2.65

On January 31, 1910, the railways and property of the Arizona Eastern Railroad Company (of Arizona), the Gila Valley, Globe & Northern Railway Company, The Maricopa & Phoenix Railroad Company, the Arizona & Colorado Railroad Company (of Arizona), The Arizona & Colorado Railroad Company (of Arizona), The Arizona & Colorado Railroad Company of New Mexico, and The Arizona Eastern Railroad Company of New Mexico, were consolidated under the name of "Arizona Eastern Railroad Company." The capital stocks of these companies were entirely owned by the Southern Pacific Company, which had also made the advances for the construction and the reconstruction of said railways.

The consolidated company's lines are situated in the Territories of Arizona and New Mexico; about 266.75 miles of railway are completed and in operation. At Phoenix, Arizona, they connect with the railway of the Phoenix & Eastern Railroad Company, which owns a railway about 95 miles in length and whose entire capital stock is owned by the Southern Pacific Company.

The Southern Pacific Company has owned for a number of years 15,309 shares of the capital stock of Wells Fargo & Co. This holding was not sufficient to carry control of the Express Company, and, moreover, it was not apparent that such control would be of any value to the Southern Pacific Company; and, therefore, advantage was taken of an opportunity to sell the entire amount owned. An extra dividend, that was paid by Wells Fargo & Co. in February, 1910, was credited to the year's income; and the profit realized from the sale of the stock was credited to profit and loss.

The Southern Pacific Company also owned 41,721 shares of the capital stock of the Mexican International R. R. Co., a large majority of the shares outstanding being owned by the National Railways of Mexico. The Southern Pacific Company was able during the year to sell its holdings to the National Railways of Mexico at a satisfactory price, and the profit realized was also credited to profit and loss.

Under the pension system put into effect on January 1, 1903, there are carried on the pension rolls of the rail and water lines 454 employes. The payments to them for the year amounted to $181,370.31.

The accompanying report of the Vice-President and Comptroller shows fully and in detail the financial and other transactions of the Southern Pacific Company and of the Proprietary Companies.

By order of the Board of Directors,
ROBERT S. LOVETT,
President.

SOUTHERN PACIFIC COMPANY AND PROPRIETARY COMPANIES.

No. 2.—COMBINED INCOME ACCOUNT FOR THE YEAR ENDED JUNE 30, 1910.

(Revenues and Expenses of "Proprietary" and "Non-Proprietary" Lines and Miscellaneous Income of the Southern Pacific Company and Proprietary Companies, combining details shown in Tables Nos. 9 and 15.)

Operating expenses (and taxes) of proprietary lines, interest on funded debt and all other expenses of proprietary companies as shown in detail in Table No. 15		$101,291,989.05
Operating expenses, taxes, and all other expenses incurred in connection with the operation of the following non-proprietary lines:		
New Mexico & Arizona R. R.	$314,605.20	
Sonora Railway	1,301,337.97	
		1,615,943.17
Expenses of Southern Pacific Company (Table No. 9).		
Expenses of operating steamship lines		6,209,731.72
Interest on funded debt as shown in detail in Table No. 6		4,806,722.89
Interest due to Proprietary Companies on advances and open accounts	$1,705,467.95	
Less interest due from Proprietary Companies, including interest charged to Oregon & California R. R. Co.	1,123,039.87	
		582,428.08
Rental to Central Pacific Ry. Co.		10,000.00
Rental to Nevada & California Ry. Co.		5,000.00
Rental to Oregon & California R. R. Co.		5,000.00
Rental to Southern Pacific R. R. Co.		10,000.00
Taxes		120,370.73
General and miscellaneous expenses		193,161.79
Annual payment for redemption of 6 per cent. steamship bonds		75,000.00
Premium on $71,000, face value, 6 per cent. steamship bonds redeemed		3,550.00
Reserve for depreciation of rolling stock owned and leased to other companies		527,594.94
Cost of surveys written off		45,041.92
Cost of examinations for water power written off		1,280.77
Balance to profit and loss (Table No. 3)		35,416,895.54
Total		$150,919,710.60

Revenues of proprietary lines and miscellaneous income of Proprietary Companies as shown in detail in Table No. 15		$130,387,815.34
Revenues of the following non-proprietary lines:		
New Mexico & Arizona R. R.	$383,487.87	
Sonora Railway	875,446.97	
		1,258,934.84
Revenues of Southern Pacific Company (Table No. 9).		
Gross revenue from operation of steamship lines		6,834,809.31
Interest on bonds owned of Proprietary Companies		617,755.51
Interest on bonds owned of companies other than Proprietary Companies		1,284,763.65
Dividends on stocks owned as shown in detail in Table No. 5		5,936,113.28
Rentals from lease of road		1,066,906.82
Hire of equipment		1,626,155.45
Rentals from lease of joint tracks, yards, and terminal facilities		193,436.64
Miscellaneous rentals		178,842.16
Net proceeds from sale and lease of lands		11,975.16
Balance of interest on loans and on open accounts other than with proprietary companies		1,521,210.44
Miscellaneous income		992.00
Total		$150,919,710.60

SOUTHERN PACIFIC COMPANY AND PROPRIETARY COMPANIES.

No. 3.—COMBINED PROFIT AND LOSS—JUNE 30, 1910.

(Combining details as shown in Tables Nos. 10 and 16.)

Dividends on stocks of Proprietary Companies, viz.:		
Central Pacific Ry. Co., Preferred	$556,000.00	
Central Pacific Ry. Co., Common	4,036,530.00	
Houston, East & West Texas Ry. Co.	192,000.00	
Houston & Shreveport R. R. Co.	40,000.00	
Louisiana Western R. R. Co.	504,000.00	
Morgan's Louisiana & Texas R. R. & S. S. Co.	750,000.00	
Nevada & California Ry. Co.	241,850.00	
Southern Pacific R. R. Co.	9,600,000.00	
Southern Pacific Terminal Co.	120,000.00	
Texas & New Orleans R. R. Co.	1,000,000.00	
	$17,040,380.00	
Less paid to Southern Pacific Co.	17,039,926.00	
		$454.00
Dividends on common stock of Southern Pacific Co., viz.:		
One and one-half per cent. paid January 1, 1910	$4,089,436.62	
One and one-half per cent. paid April 1, 1910	4,090,073.90	
One and one-half per cent. payable July 1, 1910	4,090,084.15	
One and one-half per cent. payable October 1, 1910	4,090,084.58	
Dividend paid October 1, 1909, on common stock exchanged for preferred stock and for convertible bonds between July 1, 1909, and October 1, 1909	878,213.68	
		17,237,892.93
Total		$17,238,346.93
Discount and commission on capital issues during the year		1,992,181.75
Fund for refunding outstanding old bonds of Southern Pacific R. R. Co.		1,992,000.00
Cost on books of San Antonio & Aransas Pass Ry. Co. 4 per cent. income bonds written down		2,589,671.83
Cost on books, less salvage, of property abandoned		105,681.70
Uncollectible accounts written off		208,084.77
Balance June 30, 1910, viz.:		
Southern Pacific Company	$54,756,476.75	
Proprietary Companies	80,448,836.27	
		135,205,313.02
Total		$159,331,280.00

Balance June 30, 1909, viz.:		
Southern Pacific Company	$43,318,164.34	
Proprietary Companies	71,334,431.20	
		$114,652,595.54
Balance from income account (Table No. 2)		35,416,895.54
Proceeds from sale of unpledged lands		265,136.50
Proceeds from sale of lands pledged for the redemption of bonds		1,125,328.96
Collection of old accounts		100,552.72
Annual payments to sinking funds and income from sinking fund investments		378,514.97
Adjustments in unsettled claims and accounts		146,549.97
Profit on Wells Fargo & Co.'s Express and on Mexican International R. R. Co. capital stocks sold		7,148,865.00
Difference between cost on books and amount received for property sold		43,650.03
Discount on bonds purchased and cancelled		25,097.73
Unclaimed accounts written off		28,093.04
Total		$159,331,280.00

No. 11.—SOUTHERN PACIFIC COMPANY—ASSETS—JUNE 30, 1910.

ASSETS.	June 30, 1910.	*June 30, 1909.
Capital Assets.		
Stocks and bonds of Proprietary Companies pledged—Tables Nos. 12 and 13	$232,532,667.41	$247,287,543.73
Stocks and bonds of other companies pledged	.....	5,975,513.18
Total stocks and bonds pledged	$232,532,667.41	$253,263,056.91
Stocks and bonds of Proprietary Companies unpledged—Tables Nos. 12 and 13	45,408,883.94	11,792,671.50
Stocks and bonds of other companies unpledged—Table No. 14	51,551,638.95	37,711,742.01
Bay Shore Line terminals, and other real estate	31,938,448.59	25,298,354.22
Timber treating plants, saw mills, and other property	404,698.70	375,691.80
Steamships and other floating equipment—Table No. 24	12,625,710.07	11,573,526.34
Rolling stock—Table No. 25	16,222,784.92	10,257,687.40
Advances for construction and acquisition of new lines	33,545,888.99	31,099,774.58
Advances to Southern Pacific Railroad Co. of Mexico	35,965,601.75	29,885,102.13
Advances to electric lines in California	12,103,947.75	9,082,856.92
Advances to Kern Trading & Oil Co.	4,086,700.63	3,862,737.78
Advances to Pacific Fruit Express Co.	1,165,212.25	.....
Lands and other investments	1,908,905.19	475,201.04
Total	$479,461,089.14	$424,678,402.63
Sinking funds	1,044.00	594.00
	$479,462,133.14	$424,678,996.63
Current Assets.		
Cash	$10,718,579.79	$31,783,013.42
Time loans and deposits	17,047,375.62	11,450,000.00
Loans and notes receivable	3,316,788.85	1,465,783.94
Agents and conductors	2,006,158.68	2,075,972.26
Income accrued to June 30 on securities owned	1,113,904.35	687,062.39
Individuals and companies	3,237,510.52	2,689,300.27
U. S. Government transportation	907,525.38	1,240,594.82
Material and supplies	11,241,592.98	9,561,451.26
	$49,589,436.17	$60,953,178.36
Deferred Assets.		
Individuals and companies	$182,422.13	$292,962.09
Proprietary Companies.		
Direct Navigation Co.	$46,474.76	$36,704.98
Galveston, Harrisburg & San Antonio Ry. Co.	10,391,263.47	10,502,434.45
Louisiana Western R. R. Co.	42,334.49	.....
Morgan's Louisiana & Texas R. R. & S. S. Co.	664,768.68	.....
Nevada & California Ry. Co.	42,823.93	.....
Oregon & California R. R. Co.	4,946,702.45	6,435,863.90
Southern Pacific Terminal Co.	21,533.35	104,495.77
	$16,155,901.13	$17,079,499.10
Due from other Proprietary Companies	$1,304,416.41	$1,600,694.57
Contingent Assets.		
San Antonio & Aransas Pass Ry. Co.†	$1,390,753.59	$3,980,736.58
Individuals and companies	31,784.07	178,266.81
Unadjusted accounts — Proprietary Companies	138,184.78	228,652.65
Expended for account of Colorado River Crevasse	4,022,480.29	3,769,866.36
	$5,583,202.73	$8,157,522.40
Total assets	$552,277,511.71	$512,762,853.15

*The assets for the year 1909 have been restated to accord with the classification observed in the year 1910. †Includes $3,398,000, face value, San Antonio & Aransas Pass Ry. Co. Income Four Per Cent. Bonds, on which interest is payable on January 1, of each year, only if earned, out of net earnings and income.

No. 11.—SOUTHERN PACIFIC COMPANY—LIABILITIES—JUNE 30, 1910.

LIABILITIES.	June 30, 1910.	*June 30, 1909.
Capital Liabilities.		
Common stock	$272,672,305.64	$213,910,358.64
Preferred stock called for redemption but not presented	18,325.00	58,626,400.00
Preferred stock—subscription receipts outstanding	.....	365.00
Total capital stocks	$272,690,630.64	$272,537,123.64
First mortgage six per cent. steamship bonds, due January 1, 1911	$1,644,000.00	$1,715,000.00
Four per cent. gold bonds (Central Pacific Stock Collateral), due August 1, 1949: Authenticated by Trustee. $33,818,500.00 Less in treasury 5,049,000.00	28,769,500.00	28,769,500.00
Four per cent. twenty year convertible bonds, due June 1, 1929	81,137,000.00	79,896,545.71
Four per cent. convertible bonds subscription receipts and scrip	15,040.00	.....
Four and one-half per cent. twenty year gold bonds, due July 1, 1929	227,000.00	72,000.00
Two-five years four per cent. gold bonds, due June 1, 1910	.....	7,253,000.00
San Francisco Terminal first mortgage four per cent. bonds, due April 1, 1950	15,000,000.00	.....
Total funded debt	$126,792,540.00	$117,706,045.71
	$399,483,170.64	$390,243,169.35
Current Liabilities.		
Coupons matured—unpaid	$118,635.00	$114,897.47
Coupons due July 1	3,199,600.00	3,124,482.50
Interest accrued on bonds and loans to June 30, but not due	3,379,871.25	2,435,195.62
Dividends due—unpaid	120,242.57	54,523.20
Dividends due, July 1 and October 1	8,180,168.73	8,794,585.17
Mortgage bonds satisfied	21,000.00	.....
Traffic and car service	322,562.42	651,200.62
Due to Union Pacific R. R. Co.	10,901,568.97	.....
Vouchers and payrolls	9,762,361.83	7,950,119.46
	$36,096,010.77	$23,125,004.04
Deferred Liabilities.		
Pacific Mail Steamship Co.	$198,220.04	$21,501.86
Taxes assessed but not due	346,042.69	213,974.67
Wells Fargo & Co.'s Express contract	144,000.00	176,000.00
	$688,262.73	$411,476.53
Proprietary Companies.		
Central Pacific Ry. Co.	$4,364,732.82	$4,746,879.06
Houston, East and West Texas Ry. Co.	157,742.85	227,280.41
Houston & Shreveport R. R. Co.	39,262.72	68,799.37
Houston & Texas Central R. R. Co.	732,192.87	351,486.20
Louisiana Western R. R. Co.	.....	76,422.97
Morgan's Louisiana & Texas R. R. & S. S. Co.	.....	70,964.41
Nevada & California Ry. Co.	.....	90,996.84
Southern Pacific R. R. Co.	40,146,628.73	34,862,690.93
Texas & New Orleans R. R. Co.	377,216.14	851,955.54
	$45,817,776.13	$41,347,475.73
Due to other Proprietary Companies	$1,349,172.58	$1,003,548.32
Contingent Liabilities.		
Marine insurance fund	$3,180,381.32	$3,186,137.15
Steamship insurance fund	1,607,697.54	1,607,697.54
Floating equipment replacement fund	5,447,809.15	4,694,006.36
Reserve for replacement and depreciation of rolling stock	1,481,082.40	1,160,593.98
Insurance fund	225,919.00	131,305.50
Unadjusted accounts	2,075,991.87	2,405,346.33
Principal of deferred payments on land contracts	157,760.83	128,927.98
	$14,176,642.11	$13,314,014.84
Total liabilities	$497,521,034.96	$469,444,688.81
Balance to credit of profit and loss	54,756,476.75	43,318,164.34
Total liabilities	$552,277,511.71	$512,762,853.15

*The liabilities for the year 1909 have been restated to accord with the classification observed in the year 1910.